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JULY-AUGUST 1990

AVIATION DIGEST

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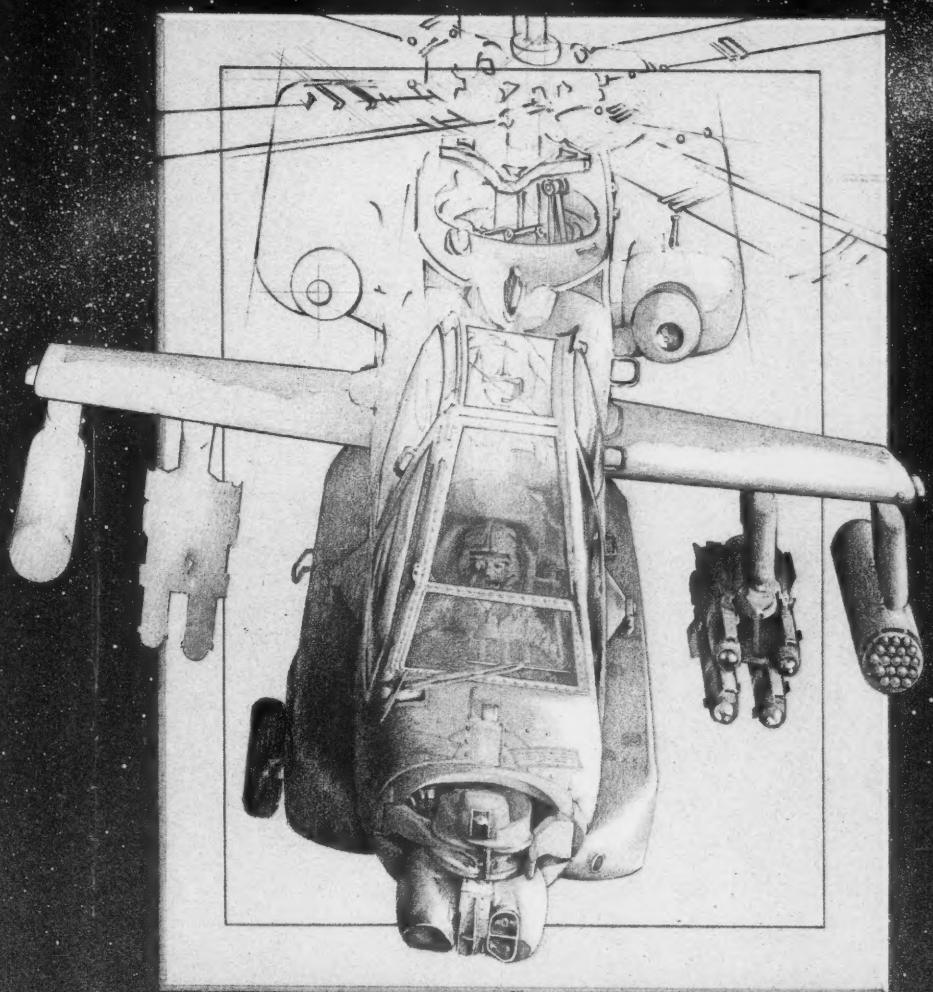
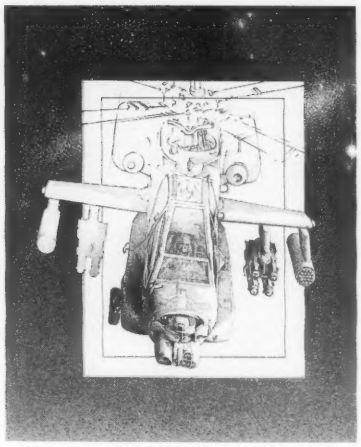


Safety integration: An investment in our future readiness

AVIATION DIGEST
PROFESSIONAL BULLETIN
1-90-4 • JULY/AUGUST 1990

1 **Quality of the Aviation Force,** MG Rudolph Ostovich III
2 **Safety Integration: An Investment in our Future Readiness,** BG C. A. Hennies
6 **Preparation, the Key to Safety,** CW2 Craig M. Dyer
10 **Squawk 7700,** CPT James P. Beckmann
12 **Safety, Just Say Yes,** CPT Frank Butler
13 **Aviation Logistics: Becoming a USAALS Instructor,** SGT Robert K. Peck
16 **AVSCOM: The Army Oil Analysis Program,** Mr. Jack Glaeser
20 **Aviation Medicine Report: Use of Nonsedating Antihistamines for Army Aviation Applications,** MAJ Darcelle M. Delrie, M.D.
24 **PEARL'S**
26 **Seeing Better in the Dark,** CPT Mark R. Pedron
28 **Nothing Mysterious About What Makes A Good Pilot,** MAJ Lauran Paine Jr.
30 **Above and Beyond the Call of Duty,** CPL Ruben Santos
32 **A Stamp for Army Aviation's 50th Anniversary,** CPT William P. Shea
34 **DES Report to the Field: DES Equivalency Evaluations,** CPT Joseph R. Goggins
36 **ATC Focus: NEXRAD Looks Into Severe Weather,** Mr. Dave Fonda
38 **The Positive Control Area,** LT Randall D. Johnson
41 **Aviation Personnel Notes: Promotion Updates; Officer Distribution Plan; SOA, SI and ASI Changes; Acquisition Corps Established; MWO Position Recoding**
44 **ACCP and Resident Training Strategy,** Mr. Don Funkhouser
45 **150,000 Accident-Free Hours,** COL Patrick J. Bodelson
46 **Views From Readers**
48 **REFORGER 90: Readiness,** CPT Michael J. Karr
50 **REFORGER 90: Reserves,** MAJ Guy A. Rogers II
52 **REFORGER 90: Support,** SPC Dean Martin
56 **Remotely Piloted Vehicles: One Marine's Perspective,** CPT Franklin D. McKinney Jr.
60 **The Israeli Air Force and the 1982 Lebanon War,** CPT Laura Tewes

Back Cover: **USAASO Sez: National Security Areas,** Mr. Jesse M. Burch Jr.



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Major General Rudolph Ostovich III
Chief, Army Aviation Branch

Quality of the Aviation Force

IN THE MAY/JUNE issue of the *Aviation Digest*, I discussed Army Aviation as a relevant force for the future. I summarized how the six fundamental imperatives of General Carl E. Vuono, Chief of Staff, U.S. Army, serve as a beacon for the future. These imperatives provide the necessary azimuth and charter to allow Army Aviation to effectively perform its mission into the 21st century.

In this issue, I will discuss the first and most important of these imperatives—*Quality*. Quality soldiers enable the Army to fulfill its worldwide strategic roles regardless of the congressional initiative to downsize our Army.

Without quality soldiers, the most sophisticated and advanced technological equipment becomes antiquated in the hands of those who use it. Quality soldiers are the combat multiplier needed to fight and win on the battlefield of today and into the future.

In aviation, we rely on bright, energetic, self-starting young men and women to maintain and sustain the world's most advanced combat aircraft systems. Our people perform complex maintenance and high-stress air traffic control functions, operate mission equipment packages incorporating state-of-the-art technologies and function as effective aircrewmembers under lethal and intense battlefield conditions.

Recent experiences have confirmed that quality soldiers produce the "right stuff" required to respond rapidly and decisively to worldwide commitments. Quality soldiers proved their worth in the Persian Gulf when our OH-58D Kiowa Warriors showed the Navy how to conduct antiship operations at night under total blackout conditions.

Quality personnel were uncompromising during the Panama "Just Cause" operation when AH-64 Apache helicopters surgically took down critical, high-value targets in areas where the force commander could least afford mistakes and collateral damage. Our Apache ground and flight crews performed flawlessly.

As testimony to the quality of the aviation force, our enlisted soldiers are among the finest people our nation entrusts to the services. Our fiscal year (FY) 1989 enlisted accessions data revealed an average general technical (GT) and Armed Forces Qualification Test (AFQT) score of 110 and 64.6, respectively. The average age was 20.6 years and 89.5 percent were high school graduates.

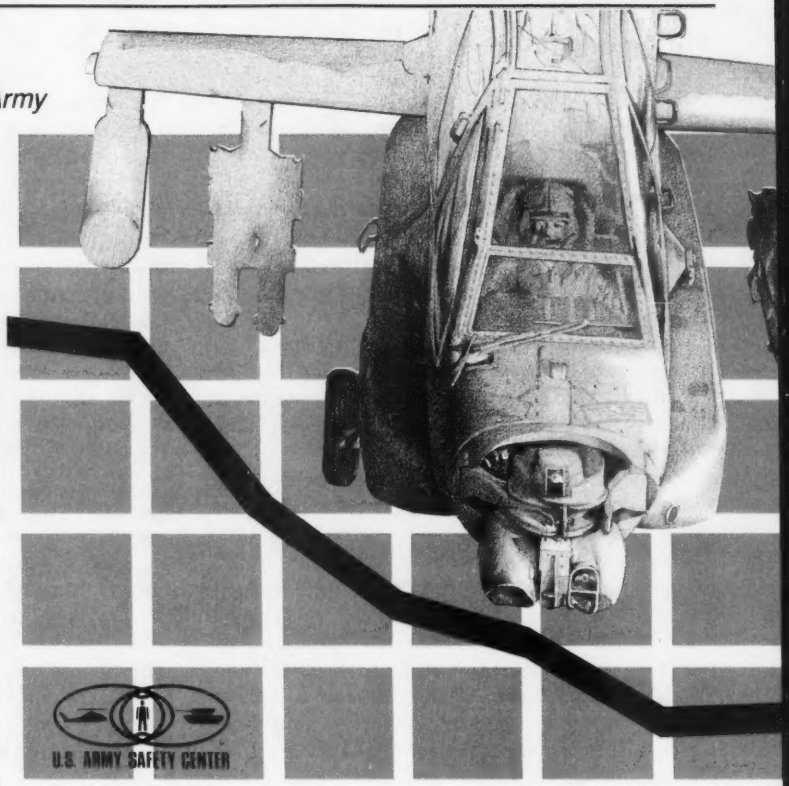
Our warrant officer quality is just as impressive—the FY 1989 accessions data indicated the average GT and Flight Aptitude Selection Test (FAST) score to be 119.5 and 115.2, respectively. The average AFQT score was 83.2 with an average age of 24.2 years. Fifty percent of the candidates are accessed from the civilian community and 50 percent from the active duty enlisted force.

Our young commissioned officers are accessed from the U.S. Military Academy, Officer Candidate School, and colleges and universities from around the nation. This year, we selected 88 of the best cadets the military academy has to offer. As an average population, they came from the top 25 percent of their graduating class. From the Reserve Officers' Training Corps, we selected 44 percent as regular Army officers, 78 percent were distinguished military graduates and 63 percent were scholarship graduates. The average grade point average and FAST scores were 3.01 and 122, respectively.

As you can see, the quality of the aviation force is magnificent. To retain that quality, we must continue to offer our soldiers the innovative and caring leadership, personal and professional challenges, and quality of life they well deserve. Our nation depends upon these soldiers as an essential attribute to our national security, and we in Army Aviation intend to remain "Above The Best."

Safety integration: An investment in our future readiness

BG C. A. Hennies
Director of Army Safety and Commanding General, U.S. Army Safety Center



We safety folks are always reporting to you on Army aircraft accidents and telling you about the things that have gone wrong. Perhaps we haven't been quite as faithful in telling you about the positive side—the things that have gone right. And there have been many.

Where we've been

To understand where we are in aviation safety now, we need to take a look at where we've been. For a historical view of Army aviation safety, we go back to 1958, because that's the year we first began recording Armywide aircraft accident data.

For every 100,000 hours flown in 1958, we had 54.3 accidents. By fiscal 1985, we had gotten the Class A rate down to 2.94, and ever since, it has been hovering around the 2.0 mark.

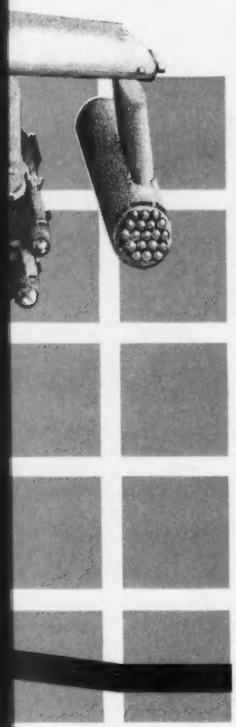
To put this in perspective, let's look at that rate of 2.0 from a battalion point of view. It takes the typical aviation battalion 10 to 12 years to fly 100,000 hours. A Class A rate of 2.0 means that the typical battalion has only 2 such accidents during all this time.

The rate certainly looks better, but rate alone doesn't reflect the magnitude of the drop. Looking only at accident rates and trying to see where we are in Army aviation safety is a little like looking at a human skeleton and trying to picture what the person looked like. We need some flesh on the bones.

We have to look at the operational environment during this time. As the rates were coming down, the mission demands were going up. Nobody has to tell you that there are a lot more risks involved in flying today than there were in 1958 or even in 1982.

One of the hardest years for anyone in Army aviation to look at is fiscal year 82. That year was Army aviation's 40th anniversary, and it would prove to be a catastrophic year from an aviation safety standpoint. In one CH-47 accident alone, 8 soldiers and 38 civilian members of an international parachute team were killed. By the time the year ended, 46 soldiers and 40 civilians had been killed, another 95 crewmembers and passengers injured, and 48 aircraft

destroyed. It was the worst Army aviation safety record in 10 years, and it triggered a full-court press in accident prevention that has gotten us to where we are today.



Where we are

So we've come a long, long way—and not just in aviation safety. The Army is safer across the board than ever before. Total Army accidents have declined steadily, and, proportionally, the greatest period of decline has been from 1985 to present. In these last 5 years, we've gone from 15,000 accidents per year to less than 10,000. And in fiscal 89, we had 2,000 fewer accidents than in the previous year. It's true that aviation accounts for only 1 percent of this total, but it's also true that aviation accounts for about 50 percent of the cost.

We also have to remember that embedded in our fiscal 1989 aviation Class A rate of 1.90 accidents per 100,000 flying hours were 35 fatalities, 30 destroyed aircraft, and a cost of $110 million. This is another reason we can no longer just talk rate and why single accidents become so important. This is why we have to start managing the numbers—because accidents don't kill statistics, they kill human beings.

Where we're going

We know that human error is involved in 8 out of 10 Class A through C accidents, so human error is the nut we have to crack. And your Safety Center is trying to do that.

In addition to improving our accident analysis to try to determine the "why" behind the error, we're in the midst of several studies that will yield information that will help combat the human-error problem. Perhaps our most important venture is the study on crew coordination. This study, in conjunction with the efforts of the Army Research Institute and the Army Aviation Center, will produce a basic definition of crew coordination and carry through to actual applications. It will result in improvements to our Aircrew Coordination Training Program by providing policy, procedures, and training for specific aircrew responsibilities and tasks, which will ultimately reduce human errors in the cockpit.

Today's realities

Now, while we're doing all this, we're living with some hard realities. Some are coming; many are already here. We're dealing with the realities of uncertainty—a very lean force structure and a very tight budget that put a lot of demands on people.

All this equals high pace. And, if we're not careful, pace can get out of control. Then the shortcuts will start—the shortcuts that lead to disregard of critical things at critical times, the shortcuts that lead to catastrophic accidents.

It's like a treadmill. Pace has to be controlled. If it's not, you're liable to do more damage than good. The first few minutes, you walk. Then you gradually speed up the pace. But you don't go full bore right away; you work up to it. We have to do the same in our units; we have to take the time to develop good habits to be able to effectively execute our tough and demanding missions without mishaps to conserve our precious and limited resources.

We are, in a sense, facing some of the challenges the airlines faced when they were deregulated. Their main objective, of course, was to make a profit. And in order to show that profit, the industry took some shortcuts.

In his book *Blind Trust* (William Morrow and Company, Inc., 1986), John J. Nance suggests that in many cases, the airline industry sacrificed safety for profit. He says that however excellent and progressive deregulation may be in terms of economic efficiency and cheap ticket prices, it has exposed and exacerbated the weaknesses in airline safety—weaknesses that we must never allow to develop in Army aviation.

Shortcuts to profit

Nance points out that, in some cases, the quest for efficiency led to shortcuts such as disregarding procedures and regulations, discouraging pilots from listing maintenance deficiencies that might ground an aircraft, overloading passengers or cargo, reducing spare parts inventories, and reducing the quality of training programs. Any of these shortcuts could happen in the Army if commanders are not wise enough to prevent them.

Let's draw some parallels. Let's equate profit to mission accomplishment—or better yet, to proficiency. Let's measure our "profit" in proficiency.

Measure profit in proficiency

Now, don't misunderstand. Just for discussion purposes, let's measure our profit not in the number of missions we accomplish, but in the degree of proficiency demonstrated in those missions.

It may not be necessary or realistic to show a profit in quantity of missions accomplished every month, because if we try, we may be taking those shortcuts. Our goal should be to show a gain in net worth measured in proficiency in our most difficult missions.

If all Army aviation units took this attitude, what we would be establishing would be a tremendous body of standardized knowledge and acceptance. So then, from unit to unit, all that would change would be the geographic scene and whether the mission is heavy or light.

So where do we invest our resources? We invest them in blue-chip options—those tough tasks that have to be trained to proficiency in order to accomplish the mission.

And that's why we develop our mission-essential task list (METL).

The challenge is to control pace through proper distribution and allocation of our resources, and the METL is our tool for doing that. When we have limited resources, we can't afford low-yield investments. We don't want to invest 75 percent of our resources on a 5-dollar return. So, we must put our hard effort to the essential tasks, less effort to the less necessary tasks; in other words, we have to put our resources where our METL is.

In the many visits I've made to aviation units in the field, I sense that they're doing a lot of flying—they're flying a flying hour program—but they're not doing a lot of training. However, it's been brought to my attention by a number of ground commanders that their perception is that the aviation units are doing a lot of training and not providing a lot of support. There are some pretty simple ways to iron out that difference and eliminate that perception.

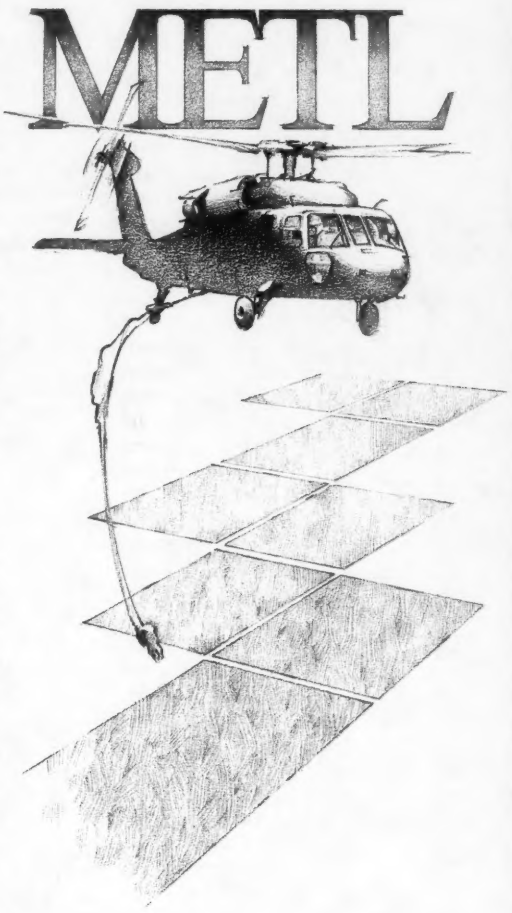
Joint development of METL

The first step is the joint development of METL. Aviation commanders and the ground commanders they support must sit down together with a duality of purpose and decide what's essential and what's not. They have to work together and be innovative in their approach to proficiency.

The goal is to show a gain in net worth every month—building proficiency within the unit so that those mission-essential task lists that we have developed with the ground commander can be accomplished.

Of course, we can't lose track of the mission, so we need to start first on those things that are the most difficult, those things that are the most important, those things that we *must* do, because that's our "profit."

But one caution: While there's nothing wrong with being "profit oriented," we can't be "profit fanatic." There are high penalties involved in trying to make a profit by taking shortcuts. You substantially reduce risks and increase profit by making calculated "investments." Put another way, invest in proficiency, not just unit proficiency but individual proficiency as well. Individual aviator proficiency is basic to any training program, and it's an area that every commander must monitor closely. Why? Because it drives the tempo that gets you to mission tasks training.



The challenges then are to develop a METL everybody can live with, then develop meaningful standards, train to a level of proficiency to those standards—*both individually and collectively*—and then enforce the standards.

Doing these things will produce a dual benefit: high readiness and safe operations.

Command climate

I want to make a final point to aviation commanders from *Blind Trust*. It has to do with climate—in our case, command climate. A lot of small commuter lines operating with a slim profit margin tried to cut corners by pushing their people to the limit. Nance says that in some cases, management tended to provide job security based on whether or not a pilot would fly an overweight aircraft or take off in less than legal weather.

As a result, some dangerous attitudes developed in these commuter lines. When pilots found that they could meet most of their schedules despite bad weather by sneaking around the minimums and the rules, a sort of perverse pride in their own abilities developed. In addition, a pilot who would fly an overweight airplane, take off in less than legal weather, or ignore mechanical problems was, more often than not, pretty secure in his job.

Nance points out that, once they established this climate, managers didn't have to order or direct their pilots to perpetuate this attitude of cowboyish noncompliance with the rules; peer pressure did it for them. And I want to point out that commanders don't have to order or direct their aviators to take shortcuts; *all they have to do is create a command climate that allows it.* And when they do, risks will outweigh their benefits, and accidents will become inevitable.

Risks can be managed

Although many of our day-to-day aviation operations involve risk, those risks can be managed. The first question to ask ourselves is, "Has anyone ever done this before?" If the answer is no, there's probably a reason. That "no" should be our signal to slow down, to crawl before we walk, walk before we run, and to make sure that what we're taking is a managed risk, not a gamble.

There's a big difference between a risk and a gamble. Risk implies a certain calculated, controlled element of danger as opposed to a gamble, which is just throwing the dice. We can't afford to just throw the dice where soldiers' lives are at stake.

The bottom line is: If you conduct tough, realistic training through proper risk management, you're not gambling with soldiers' lives; you're increasing your net worth by protecting your resources.

It can be done . . .

The better you train, the more you use risk management, the less luck will factor into your success. Units have proven this. We have units that have incredible safety records, units that have flown thousands of hours and many, many years without an accident. Let me give you some examples:

- Aviation Detachment, 172d Infantry Brigade (Alaska), Fort Greely, Alaska, has flown for 26 years in some of the toughest weather conditions in the world without a Class A, B, or C accident.
- 4th Brigade, 1st Armored Division, USAREUR, has flown more than 150,000 accident-free hours.
- New Cumberland Army Depot, U.S. Army Materiel Development and Readiness Command, New Cumberland, PA, has had only one accident since 1970—a Class C in 1972.
- 1st Battalion, 212th Aviation Regiment, Aviation Training Brigade, Fort Rucker, AL, flew 290,000 hours without a Class A, B, or C accident.

These units—and there are many others out there—have been able to sustain these outstanding safety records because an attitude has been perpetuated from commander to commander that accidents are not the cost of doing business. These units have evolutionary programs passed to and reinforced by succeeding commanders who *integrate* safety into the way they do business. And, it's no accident that the units with the good safety records are also the units with the tremendous readiness records.

It is these units that are carrying the safety banner into the 90s.

Safety challenge in the 90s and beyond

The bottom line is that safety must be embedded into the mindset of leaders at all levels through awareness and leader development. We must integrate safety into all aspects of military life in order to create safe, professional aviators.

These aviators are happiest when flying, and they like to fly tough missions. But they like to fly with a meaning and a purpose. They like to have meaningful training programs that get them to a level of proficiency and what I call "prudent confidence" to accomplish their missions.

And that's what we, the leadership, should gear our training toward: that we develop tough aviators who don't have bad habits, aviators who will deliver on time and on target.

The way to do that is to, first, know what we're about—be clear about our purpose and our mission—and then to set high standards and train to those standards.

Always.

Every day.

Every night.

No shortcuts.

No compromises.

Because, bottom line, safety integration is an investment in our future readiness. ■

Preparation, the Key to Safety

CW2 Craig M. Dyer
B Company, 23d Task Force
APO New York

FLYING IS AN inherently dangerous business that requires battling for safety on all fronts. As competent aviators, our job is to fight these battles daily to reduce associated risks related to aviation and provide a combat capable force. Military commanders and safety officers in all arenas preach safety continuously. While all of us, as professionals, have incorporated safety into our consciousness, accidents unfortunately still occur. Striving for an accident-free rate is a demanding and complex goal of every military unit. Achieving and maintaining this goal can be elusive at best, in the safest organizations. Because of the crucial nature of flying, something, somewhere, sometime, may go wrong.

One of the unwritten rules in aviation is as follows: If something can go wrong it will and it is only a matter of time before it does. While this rule reflects a realistic attitude bordering on pessimism, most of us tend to believe, "it will never happen to us." However, if you stay in aviation long enough, a time will come when you will have to deal with an accident or tragic incident. It may be major or minor. When "that something" does go wrong, will you be prepared to deal with the situation? This article provides useful information for that moment when disaster strikes and you are thrust into critical circumstances.

For the second time in my brief aviation career, I have been involved in a situation during a normal training flight when a tragedy has occurred. While not directly involved in each specific incident, both Class A mishaps, I was a crewmember aboard the first aircraft to arrive at the crash sites. Thus, I turned my ordinary training missions into search and rescue operations.

Each accident involved a single aircraft and critically injured personnel with medical evacuation (MEDEVAC) unavailable to assist. My focus of attention concerning these mishaps is centered on the most recent and more acute of the two. I am not a MEDEVAC pilot. However, the information discussed in this article is to aid anyone who deals with similar situations in the future.

An OH-58 Kiowa crew, performing a night vision devices (NVDs) training mission, in an approved local training area, struck a 180-foot high tension wire and crashed. The pilot was killed, his aerial observer was severely injured and the aircraft was destroyed. The weather that night was more than adequate, with no ceiling and unrestrictive visibility although moon illumination was minimal. At the time of the crash, the single ship aircraft was en route from a local helicopter training area to its home station. Flight following was with a nearby airfield control tower. The pilot was expected to report entering the control zone at a designated point on the airfield. However, the tower never received his report.

Acting as air mission commander for a flight of two UH-60 Black Hawks, our mission was to

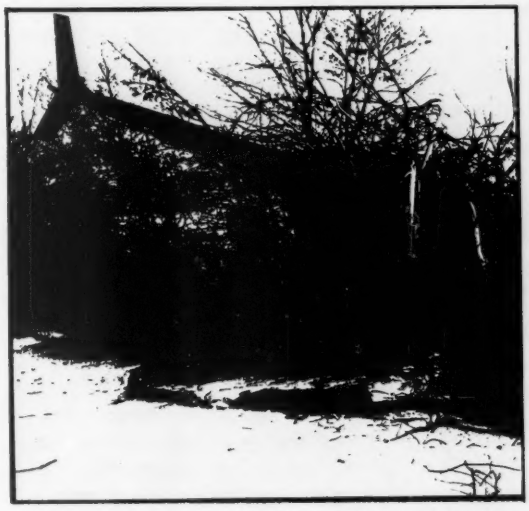
conduct NVD mission and currency training in an adjacent training area. Upon completion of our second training period, we were also en route to our home airfield. We contacted the same control tower with which the OH-58 was flight following, to request transition through their control zone. Once clearance was received, the tower asked if we could contact the OH-58. Tower informed us that they had lost communication with the aircraft and the pilot never reported entering the control zone. Our transition route-of-flight took us from east-to-west north of the airfield. The route for the OH-58 was from the northwest-to-south. We were scheduled to pass over the same designated reporting point that the OH-58 was scheduled to report reaching.

During our transition at minimum safe altitude, we attempted to contact the OH-58 numerous times on the specific training area and tower frequencies. We also unsuccessfully conducted a visual search for the OH-58 in the vicinity of the designated checkpoint. At this point, the farthest thing from our minds was that an aircraft had actually crashed. The worst case, we thought, was that the crew had to make a precautionary landing, was unable to notify the tower, and was in the process of trying to reach a telephone.

After reaching the western edge of the control zone, we decided to turn around and not give up the search so quickly. We requested another transition, this time from west-to-east. We also asked permission to use the guard frequency. After searching the northern area of the control zone, and we were still unable to contact the OH-58 on guard, our concerns began to grow. When our west-to-east search was complete, we requested tower to verify the route-of-flight of the OH-58 once more. By now, another aircraft, an AH-1 Cobra, had joined us in the search. The AH-1 crew was informed of the situation. The AH-1 was en route to the area the OH-58 reported leaving. We concentrated our search from the control zone reporting point to that area.

Within minutes of our search from the checkpoint to the area the OH-58 reported leaving, we spotted a small single light. No other lights were within a kilometer. The temperature at the time was below zero degrees Celsius. It seemed odd that anyone would be shining a light at a helicopter for no apparent reason. We decided to investigate, and landed about 75 meters in front of the light. Our companion aircraft stayed airborne for communication purposes. Upon landing, we looked through the NVDs but we could not make out who or what was shining the light. Looking under, not using the NVDs, we could not see the light at all. Our crewchief went to find out what exactly was going on. Arriving at the light, he began to signal us with his flashlight. Still unaware of what was happening, my copilot left the aircraft to give assistance and relay information. When my copilot returned, he informed me that an aircraft did in fact crash and there were injured personnel.

Receiving this information, I advised our companion aircraft crew of the situation, then asked them to notify the tower. I also requested MEDEVAC assistance along with obtaining an accurate grid location. At this point, however, the search was not over. The crewmember shining the light at us was the enlisted aerial observer. Being injured, in severe shock and disoriented, he had managed to walk about 200 meters away from the crash site.



When tragedy occurs, such as the accident involving this crashed OH–58 Kiowa, being prepared to deal with the situation is key to safety.

This created a problem in locating the pilot and aircraft. The ground search turned out to be more difficult than the air search.

The AH-1 crew was informed of our location and arrived shortly after being notified. Once on the ground, they assisted in the search for the pilot and aircraft. When my copilot returned, he mentioned that he needed his NVDs. He was unable to see anything with his small flashlight. At this time, the aircraft landing light was on and pointed at the aerial observer. This added light helped the AH-1 crew find the location. It also provided enough light for our companion aircraft to spot the aircraft wreckage under a large set of power lines. Frustratingly, our companion aircraft did not realize that we did not know where the wreckage was, and did not inform us of the location.

While my copilot was donning his NVDs, I turned on my survival radio and gave it to him. This allowed us to communicate out of sight. He was also able to quickly inform us of what was going on while searching for the pilot. I was the only crewmember aboard my aircraft who had a radio. Because of a shortage of radios within our unit, the priority for radios was given to the pilot in command (PC). The copilot took the first aid kit and a cold weather kit that was in the aircraft.

The copilot stabilized the aerial observer, then assisted the AH-1 crew in search of the pilot. With the aid of the NVDs, he was able to find the aircraft wreckage. While searching the wreckage a second time, he spotted the pilot buried beneath. He informed us via survival radio that they had found the pilot was unconscious, severely injured and with a possible pulse. Shortly before this information, our companion aircraft relayed to me that MEDEVAC assistance was unavailable. At that time, we decided to transport the injured crew to the hospital in our own aircraft. The PC of our companion aircraft notified the tower of our decision and requested an ambulance be standing by at the helipad. Within 10 minutes of departure, the injured crewmembers were at the hospital.

The decision to transport injured personnel should rest with the air mission commander or PC of the aircraft performing the evacuation. This decision is the most demanding one to make. Only in extreme life or death circumstances, with no other viable means of medical assistance available, should it be considered. In our situation, the word was that we would not receive medical assistance and we were within 10 kilometers of a hospital. About 20 minutes after our companion aircraft departed to the hospital helipad a ground ambulance arrived. Each particular situation will dictate what method of transportation should be employed. Each option should be carefully calculated.

The search and rescue aspect of this incident was not accomplished without complications and problems. The fact that it was dark created another whole dimension to the complexity of events. All of the crewmembers involved in this incident feel that we did our best. The findings of the autopsy report revealed that there wasn't anything that could have been accomplished to save the pilot's life. It appeared that he died upon impact or shortly afterward. The medical personnel who treated the observer indicated that if we had not transported him to the hospital when we did, he probably would not have made it another hour exposed to the cold with his injuries, blood loss and shock condition.

As a result of the difficulties experienced during this situation, three important items stand out. Communication, teamwork and equipment are your most valuable resources. Manage these elements wisely and the success of any mission will be enhanced.

Communication. During this mishap, use of the survival radio was instrumental in relaying information rapidly. This allowed decisions to be made and actions accomplished based on those decisions with minimal time wasted. Most associated with aviation tend to think of using the survival radio only for their own rescue. The radio allowed my copilot to inform us immediately when the pilot and wreckage were found, and the apparent condition of the pilot. Reaction to the events was immediate and all the necessary authorities were notified through additional communication with the tower by our airborne companion aircraft. The faster organizations, such as the hospital, are notified the better they will be prepared to deal with the crisis and provide assistance.

Another aspect of communication, not often thought of, is signaling. The injured aerial observer shined his double "A" battery flashlight at us and we reacted. The light saved his life. Any form of effective communication undeniably saves lives.

Teamwork. Teamwork provides a diversification of tasks. One person could not have accomplished all that was done in double the amount of time.

Our companion aircraft maintained a high cap providing essential communications and eventually transporting the injured crew. As the air mission commander, I provided the ground-to-air link that maintained command and control. Our crewchief stayed to aid the observer and monitor his condition. The AH-1 crew along with my copilot located the pilot and wreckage and informed us of the status of events. The teamwork involved increased the efficiency of each task and decreased the time required to manage the situation. Teamwork positively saves lives.

Equipment. I have already expressed the importance of the survival radio as an important tool in any critical situation. Every piece of equipment available should be considered for use in any circumstance. If we had not been flying with NVDs, we would have never seen the observer's flashlight. Finding the aircraft wreckage and pilot buried beneath it would have taken much longer than it did. The NVDs aided immensely.

If the observer had not had his flashlight in his flight suit panel marker pocket, he would not have been able to signal us. His injuries were such that, if he wanted to extract any item from his survival vest, he most probably could not. In any crash sequence, what you have with you at the time will most presumably be the only things available for use to save your life.

During night operations it is essential to have more than one flashlight. Our experience dictate the use of as many flashlights as possible. However, we turned up short without quality high-power lights.

It is imperative to know the function and location of all the survival items in your vest and aircraft. Aircraft cold and warm weather kits should be easily accessible and obtainable with one hand. Standardized locations of these items in aircraft will prevent searching for equipment in critical situations when time is crucial.

There is no substitute for creative thinking when it comes to equipment applications. The AH-1 crew and my copilot used one of the passenger seats from our companion aircraft as a support stretcher to transport the pilot to the aircraft.

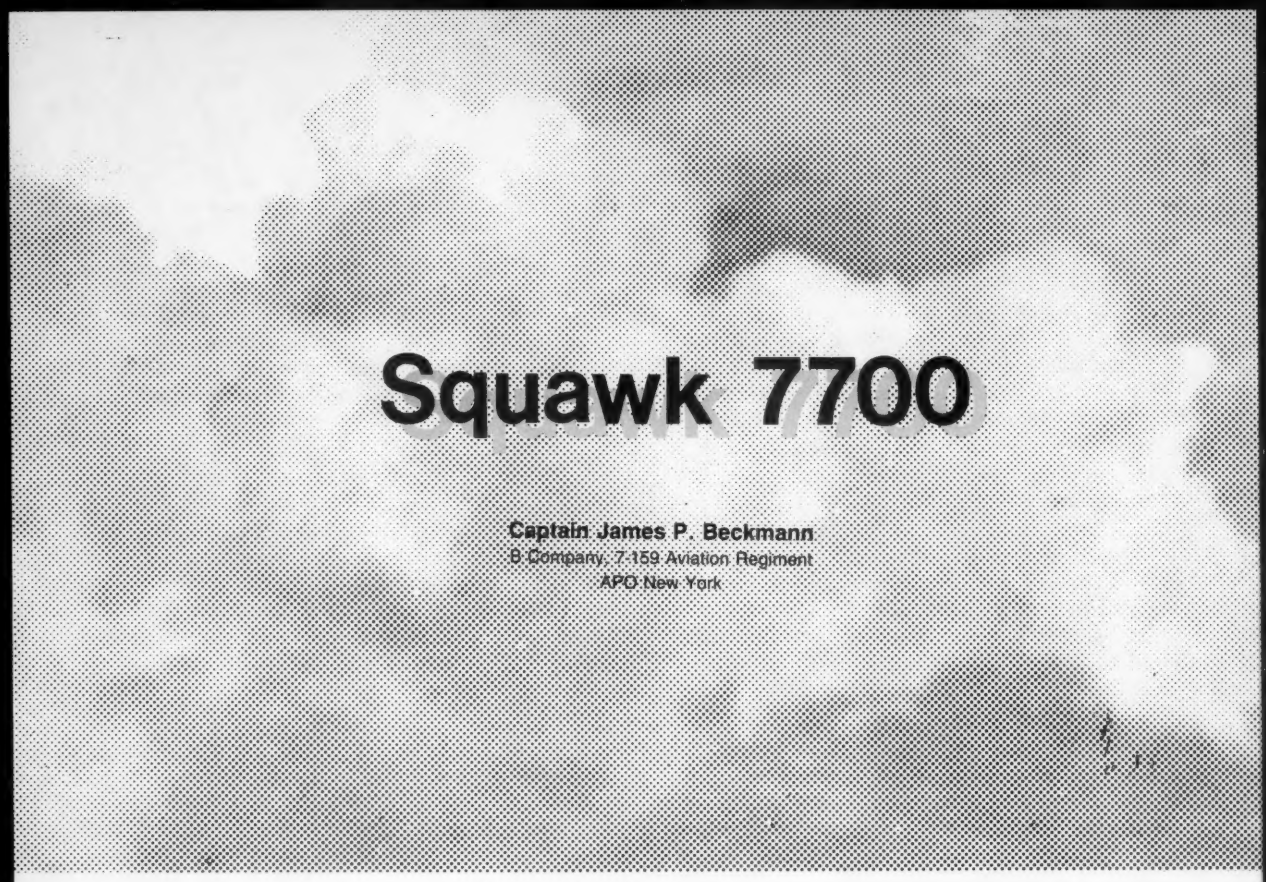
Units are encouraged to procure emergency locating transmitters (ELTs). If the OH-58 had been equipped with an ELT, notification of the crash would have been immediate. The proximity of the crash to the airfield with which the pilot was flight following was sufficient for an ELT to alert the tower. The tower then could have initiated a search without delay. Although most Army aircraft do not have ELT direction finding capability, it is important to realize that the guard receivers incorporated in all aircraft radios are capable of receiving the ELT signal. Aircraft in the vicinity of downed aircraft also will be notified immediately. These two factors combined could have expedited rescue efforts.

Flight data recorders (FDRs) are another area of interest. While FDRs will not directly prevent an accident from occurring, they do provide useful information that can be applied to prevent future accidents. Productive use of all equipment resources available definitely saves lives.

The subjects discussed here will not provide all the answers pertaining to every critical situation. Hopefully, they will provide insight that will assist anyone who encounters similar instances. Associated with any comparable circumstance will be a unique set of problems with which to contend. While it is impossible to predict future occurrences and the problems accompanying them, preparing for the unexpected starts with eliminating complacency and gathering useful information related to the topic. Additional information can be obtained from the following publications:

- Army Regulation (AR) 385-40, *Accident Reporting and Records.*
- AR 385-95, *Army Aviation Accident Prevention.*
- Department of the Army Pamphlet 385-95, *Aircraft Accident Investigation and Reporting.*
- Field Manual 1-302, *Aviation Life Support Equipment for Army Aircrews.*

The number of Class A accidents for fiscal year (FY) 1988 was 32 with 39 fatalities. In FY 1989 the number of accidents was 32, while decreasing the previous year's fatalities to 35. The major cause of these accidents remains human error. It is everyone's goal to eliminate the human error factor to prevent as many accidents as possible. However, it is just as important to be prepared for the time when *something* unfortunately does go awry. Then your primary consideration becomes the safety and survival of yourself and your crew or other brethren in peril. Inevitably, preparation begins with you, the aircrewmember.



Squawk 7700

Captain James P. Beckmann
B Company, 7-159 Aviation Regiment
APO New York

EVERY YEAR numerous accidents result from pilots attempting to continue under visual meteorological conditions (VMC) while in instrument meteorological conditions (IMC). Aviators are evaluated each year on their knowledge of emergency IMC procedures during their Annual Proficiency and Readiness Test. Usually, the instructor pilot (IP) takes the controls and has the pilot put the hood on and perform an approach and maybe one or two unusual attitude recoveries. But, does this really prepare a pilot for an encounter with inadvertent IMC?

While returning from a field training exercise in June 1989, I was able to practice my skills and knowledge of inadvertent IMC procedures while flying as chalk two in a flight of three UH-1 Hueys. We were making our second trip when we encountered heavy rainshowers, which quickly reduced visibility to less than 300 meters. We executed a 180-degree turn to exit the rainshowers. As we gained altitude to clear a high-tension powerline, the pilot in command and I lost visual reference with the ground.

All aviators have memorized the procedures for inadvertent IMC. We all know to level the aircraft, maintain heading, establish climb power and air speed, squawk 7700 and contact the controlling agency on guard frequency. We all can tell the IP these procedures on our checkride; however, there is more to inadvertent IMC than memorizing these procedures. If you prepare yourself and your aircraft for IMC, your chances of a smooth transition to instrument flight and a safe recovery will be increased.

If you are out flying in marginal VMC, or are experiencing deteriorating weather conditions, here are some simple but sensible

things you can do to help yourself be prepared. First, don't be afraid to find a place to land to wait for better weather. This is probably the hardest thing to do with "get-homeitis" or pressing mission requirements. I recommend establishing your own weather minimums that are higher than those in AR 95-1, *Army Aviation: Flight Regulations*, and then sticking to them. In other words, be constantly aware of places to land or deviate, and take into account local terrain and obstacles while factoring in your own experience and ability.

Second, if you're flying in marginal conditions, prepare yourself and the aircraft for IMC. Get out the approach procedures and review the IMC procedures as well as the approaches for the recovery field. Leave some headroom to avoid interfering with IFR traffic during inadverent IMC climbing maneuvers.

Next, pre-tune the navigation and communication radios. This way, you will not have to fumble with those tasks upon inadvertent IMC, and you can devote your attention to the critical aspects of maintaining aircraft control.

Finally, if you lose ground reference, don't try to re-establish VMC. If you have prepared yourself, you should not hesitate in establishing yourself on the instruments.

We used these procedures and, although they didn't make our encounter with inadvertent IMC pleasant, they helped to make our transition easy and there was no confusion in our recovery. The key to our safe execution of this emergency, as in all emergencies, was planning ahead. Plan ahead so that, if you go inadvertent IMC, you will be able to make a safe recovery.

Safety, Just Say Yes

Captain Frank Butler
Chief, Cargo Utilities Branch
Aviation Division
Department of Tactics and Simulation
U.S. Army Aviation Center
Fort Rucker, AL

As technology advances, the complexity of the modern battlefield continues to multiply. The U.S. Army, in turn, develops more sophisticated equipment to aid us in managing the battle. In the end, however, our success in battle relies on people and how well they communicate. As aviators, we call this *dynamics of aircrew communications and coordination (DACC).*

Clear, concise communication between aircrews and other aviation team members is essential. Therefore, training our people to communicate effectively is imperative.

Experience demonstrates that most Class A accidents occur because of human error. In fact, from fiscal year (FY) 1983 through FY 1989, environmental factors caused 9 percent of our accidents; materiel failure, 17; and human error, 74. In the human error category, about 5 percent of the accidents were caused by maintenance personnel's failure to perform work by the book; 10 percent by supervisory error in failing to manage risk at unit level; and 80 percent by flight crew failure in following procedures.

Note that most accidents result from human errors and flight crews' failing to follow established guidelines and procedures. Complacency, coupled with poor aircrew communication and coordination, ultimately results in accidents. Keep in mind that the usual result of an aviation accident is either loss of life or permanent injury and the destruction of extremely valuable combat resources. Data indicate that human error is a factor in most accidents. They further indicate that people are the problem. Therefore, with the proper training, correct guidance and continued emphasis on safety, people are the solution.

Accident investigations have identified four trends that directly relate to human-error accidents.

- Too few questions asked.
- Too little information shared.
- Too many assumptions made.
- Unresolved conflicting views.

Failure to exert appropriate first line supervisory influence leads to tragedy. Currently, every aviator receives instruction in DACC. This block of instruction is designed to pique the awareness of students and aviators in the essential nature of effective communicative skills. Safety officers can broaden this instruction by using trainers to administer the U.S. Army Aviation Center Programed Test 25, exportable training package, on DACC. Trainers can present the entire package with no additional outside support.

Today our aircraft and missions are more complex than before. Each of us, from crewchief to commander, plays a vital role in reducing human error accidents. All it takes is participation. Become active in this endeavor. Remember—*Safety, Just Say Yes!*

Becoming A USAALS Instructor

Sergeant Robert K. Peck
Attack Helicopter Division
Department of Attack Helicopter Training
Fort Eustis, VA

Sergeant Peck...we've just received your levy notice from the military personnel office; you're headed to Ft. Eustis, VA."

I had waited 8 months to hear the words: I was going to leave Korea and report to Ft. Eustis to be an instructor (I hoped). I remember thinking how great it would be to return to the post where I attended advanced individual training (AIT) and see things from a different perspective. I had always felt that one had no easier job in the Army: pin on an "instructor" brassard; go to the head of the class; and work a normal "9-to-5" job for a change.

I've never been so wrong in my life!

After arriving at Ft. Eustis, I was amazed at how little things had changed. At first glance, I thought the post had not changed much during my 5-year hiatus in the field. First stop—in-processing where I began the typical Army routine: finance, transportation, 201 file—you know, "the essentials." That, however, was when the routine changed.

For the first time in my Army career, I was going to see face-to-face the person who would decide my next assignment: the sergeant major of the U.S. Army Aviation Logistics School (USAALS). I was greatly impressed to think the sergeant major was taking time to personally interview me for a position as a school instructor.

It was then when I began to realize that USAALS instructors must be important to the Army, considering the time the sergeant major spent "hand picking" them. In the time it normally takes to find out where you'll be sleeping on the first night, I had finished in-processing. As the sergeant major handed me a slip of paper with my position and paragraph line numbers on it, he welcomed me on board and wished me good luck.

Only a matter of minutes passed before I was at my new unit receiving my welcome briefings. The first thing I learned during the briefings was USAALS doesn't let "just anyone" get on a platform and teach AIT students. I was informed all new instructors were required to attend and pass an instructor training course (ITC) before instructing students.

ITC

The next rung in the ladder was to attend ITC. I had heard horror stories about the dreaded ITC. I was told by those who attended before me that ITC

was almost impossible to pass and had about a 50-percent attrition rate. This was not very encouraging. All I could do was wait for my class date and see for myself.

That day came soon enough, and I was getting a first-hand account of everything I was told. The course was difficult, to put it mildly. The one thing that makes ITC a "bear" is the class workload. Because of the curriculum setup, the instructors are required to disseminate tremendous amounts of information in a relatively short period of 1 week.

During the remaining 2 weeks, the students prepare two class presentations and the following: lesson plans, lesson unit outlines, presentation outlines and review of questions. An instructor must inspect and approve these steps before the student can practice the presentation.

During the first week, the class load reminded me of the book, *Future Shock*, by Alvin Toffler. The author discusses how a lot of information received at increasingly faster rates can overload a person who cannot adapt to change. I thought Mr. Toffler could probably learn a thing or two by attending ITC at Ft. Eustis.

I, however, was the one going through class number 7-89. I needed to use all the time available to try and sort through the constant deluge of information. Even though ITC had recently been revamped and decreased its failure rate, the course was still demanding.

The instructors who evaluate each student's presentation are bound by strict guidelines. I remember feeling pretty good about my first class as I walked to the afteraction review. I was told I was a "no-go" due to my excessive use of the transition word "OK." I was devastated: I gave everything I had to prepare for my presentation, only to be thwarted by a "crutch word."

My instructors told me not to worry as I would have two more tries. I began to see why the course was feared as much as it was respected. When I asked the instructor who came up with all of the "attention-to-detail" type requirements, I was told, "...a board of U.S. Army sergeants major." Well, that made sense.

As it turned out, I would need those skills when I made my second trek to the podium to get a "go" for my presentation. My second presentation was a tremendous improvement over the first, and my instructor gave me a "go." It was over! I had finally passed ITC and lived to tell about it.

USAALS Instructor

After 3 long weeks of rigid training in ITC, I thought to myself, "Now I'm going to show everyone...I'm going to be the best instructor they've ever seen."

I wanted everything to be perfect for my first class as a primary instructor. First impressions are the ones that stand out in people's minds. I tried to get everything prepared for a flawless presentation to my first class.

I came in early on that first morning to allow for any unforeseen difficulties. Everything went perfectly; everything, that is, except me. In the time it had taken me to wake up, rehearse the first lesson unit in my mind and arrive at the hangar, I had deteriorated into a fumbling bundle of nerves! I glanced at the clock: 0620. My students should be moving toward the classroom, I thought.

With what remaining nerves I possessed, I gathered up my lesson unit materials and made my way

to the classroom. As I walked down the 15-foot hallway toward my classroom, I could have sworn the trip took 3 minutes! The 12 students waiting for me to begin teaching must have had another 50 to 60 students packed in their desks; I swear it.

There I was face-to-face with some of the greenest AIT students in aviation. I was petrified; afraid I was not going to get through my first class alive. It was then a comment from a fellow ITC graduate came to mind: "There ain't nothin' to it...but to do it!" So, I just "did it."

The seconds turned into minutes, the minutes into hours, and finally, the class was over...wait a minute, it's only break time. That was only 50 minutes! I had another five class periods to go until I could call it a day. The other class periods became progressively easier to give as a lot of the ITC course material and guidelines came back to me.

Six hours and a few gray hairs later, it was over. I had finished "day one" of the powertrain and rotor block of instruction, only 7 more days to go before the cycle started all over again.

I found teaching a lot like maintenance; you never really reach a stopping point, and no two situations are ever the same. I realized the job is never done...always more students and different questions to ask.

It has been some time since I made that first lonely walk up to the podium, and I have sent many students out into the aviation maintenance field to begin their Army careers. Every time I see another student graduate move to his first duty station, I cannot help but wonder, "Did I do everything I could...was there anything else I could have done to help that soldier become a better mechanic?"

Those are the kind of questions every instructor should have in the back of the mind. In addition, every soldier who leaves USAALS reflects the noncommissioned officer (NCO) teacher. Excellence is not the goal at USAALS; it is the standard.

Nearby Attractions

Instructing is not the only reason I was interested in coming back to Ft. Eustis. I really enjoy driving to the beach to relax on weekends. The trip from the gate of Ft. Eustis to Virginia Beach is only 50 miles—less than an hour on the interstate.

Also nearby are the historic cities of Yorktown and Williamsburg. Yorktown especially appeals to me—I was interested in stories relating to promotion board questions I've answered on military history. I always wanted to go to the Yorktown Museum to see the actual tent where General George Washington commanded his colonial troops. I stood where our first commander in chief stood and saw unchanged battlefields of 200 years ago. It may seem strange, but this experience made my job as a soldier seem just a little more important and a lot more rewarding.

I was also pleased to discover that Busch Gardens is only 10 miles from my front door. I have always enjoyed going to amusement parks, and Busch Gardens is definitely one of the best. While there, I had the opportunity to visit "The Old Country." I never realized a theme park "inside" of the main park. The Old Country is based on the cultures of European countries. I've never been to Germany; however, after visiting The Old Country, I'm positive that's where I want to go for my next overseas tour.

I also couldn't believe Ft. Eustis offered all of the surrounding historical areas, "plus" the hunting and fishing areas, too. I like to get out into nature once in a while. With the thousands of wooded acres Ft. Eustis affords, I just couldn't find a better place to hunt and fish.

Being an instructor at USAALS has been more rewarding and exciting than I ever anticipated. I'm sure this experience will be even more so in the months to come.

If you feel you have some valuable knowledge in the aviation field and you can handle the exacting standards of a training unit—then talk to your personnel administration center NCO about requesting an assignment to Ft. Eustis after your next overseas tour or even as a stateside swap.

If you're lucky, you may find yourself on your way to the most challenging job Army Aviation has to offer as an NCO: an instructor of students at USAALS.

The Army Oil Analysis Program

An analysis of engine oil is like testing blood: blood tests detect physical changes in people—oil analyses detect physical changes in engines.

Mr. Jack Glaeser
Depot Engineering and Reliability Centered Maintenance
Support Office
Corpus Christi Army Depot
Corpus Christi, TX

THE ARMY OIL Analysis Program (AOAP) is part of the Department of Defense initiative begun at Ft. Rucker, AL, in 1964 by Mr. Joseph P. Cribbins, now special assistant to the Deputy Chief of Logistics, Headquarters, Department of the Army. The main objectives of this program are to enhance safety; improve operational readiness of Army equipment; detect impending equipment component failures; avoid extensive repairs; and conserve lubricating and hydraulic oils with on-line and laboratory analyses of oil and grease samples.

Twenty-four AOAP laboratories and two mobile labs support Army operations worldwide. (Their locations and addresses are near the end of this article.) These labs interact with labs from other military services as part of the Joint Oil Analysis Program. Mr. Cribbins is responsible for general staff supervision and approves all AOAP policy. The Depot Engineering and Reliability Centered Maintenance Support Office (DERSO) is the Aviation Systems Command Program Manager for all aeronautical equipment in the Regular Army, including units in the Army National Guard and Reserve Components. Army AOAP encompasses 8,700 helicopters and fixed-wing aircraft and 46,664 subsystems.

Evolution

Originally, AOAP was called the Army Spectrometric Oil Analysis Program, because the only diagnostic tool recognized at the time was the spectrometer. Engineering technology expanded to include more diagnostic techniques, such as microscopy, ferrography, discriminating chip detectors,

filter inspections and even fine-filter debris analysis. This expansion caused the name to change to AOAP to encompass all these disciplines of hydraulic oils and grease samplings. Some aviation personnel refer to the program as the Army lubricated component analysis program.

A Diagnostic Tool

Basically, AOAP is the analysis of oil and grease from lubricated components. The analysis is used as a diagnostic tool to determine the internal condition of engines, gearboxes, transmissions and other lubricated systems. This analysis is a test or a series of tests that show the condition of equipment components. Also, this analysis precisely detects and quantitatively measures wear metals and contaminants in oil or grease, chip detectors and filters.

AOAP Growth

During the beginning of AOAP, the spectrometer was the basic oil analysis instrument. The AOAP has grown to include new laboratory instrumentation and technological growth in aircraft systems. The ferrograph is being used more as a diagnostic tool. Modern aircraft advances include discriminating chip detectors, in-line particle counters and fine filtration. Fine-mesh filters remove all wear metals and contaminants from lubricating systems that would otherwise have been detected by the spectrometer or ferrograph. Therefore, routine laboratory sampling is not conducted on systems with fine filtration, such as on the OH-58D Kiowa Warrior helicopter. However, AOAP on this system includes discriminating chip detectors, fine filtration and the diagnostic methods from TM 55-1520-248-23.

AOAP Instrumentation

The most familiar analytical instruments used in the AOAP are the spectrometer and ferrograph. However, high-powered microscopes, chip detectors and the naked eye are used in this program to detect contaminants and failing parts. Spectrometric analysis is used to determine the concentrations of various wear metals, such as iron, copper and silver in oil samples. Wear-metal particles are produced by friction of moving parts in mechanical systems. These particles enter the oil system and then are dispersed throughout the system itself.

Spectroscopy detects both the kinds and quantities of metallic particles in the oil sample. Analysis identifies the wear-metal elements and aids in determining the part from where they came. These parts can be repaired or replaced before they damage the assembly or mechanical system. Periodic samplings can reveal abnormal wear trends.

Ferrographic analysis is used as a primary grease analysis test on selected components. The ferrograph extends the range of detectable particle sizes beyond that of the spectrometer. In addition, the ferrograph is used to determine the size, shape and type of wear-metal particles generated by a worn component. Not only are wear metals detected by the analysis, but contaminants are discovered. Two contaminants are magnesium (indication of internal corrosion) and silicon (indication of sand and dirt).

Particle Sizes

Wear-metal particles are measured in microns (micrometers), or one millionth of a meter. The spectrometer identifies particles in the 1 to 8 micron range and the ferrograph measures particles in the 7 to 250 micron range. To better understand the size of wear metals in oil samples, a *micrometer* is 0.000039 inch; a *period* on this page is about 254 microns or 0.01 inch; and the resolving power of the eye is nearly 40 microns or 0.0016 inch.

Engineering Analysis

A component is removed when the AOAP discloses abnormal wear metals or contamination. The component's removal serves three purposes—

- Precludes catastrophic failures.
- Removes component before any actual failure and avoids extensive repairs.
- Prevents secondary damage to the component and allows completion of an engineering analysis of the failing component. The component is completely disassembled to reveal the failing parts and to determine the failure mode.

The Analytical Investigation Branch (AIB) personnel disassemble AOAP-removed components at the Corpus Christi Army Depot (CCAD), TX.

The Army Oil Analysis Program

DERSO engineers monitor the teardown process to determine the failure mode of selected components. One of the reasons that DERSO is collocated with CCAD is to accomplish the AOAP engineering analysis of aviation components. The analysis data is documented, scored and entered in the reliability centered maintenance data bank.

This data is used to support engineering change proposals and component improvement programs to improve safety and readiness of Army Aviation equipment. This AOAP can uncover parts not properly designed or manufactured and reveal production processes not up to specifications. As an example, oil and grease systems are routinely sampled and analyzed at CCAD after items are overhauled and before shipment to the field units.

AOAP Initiatives

Routine grease samplings and ferrographic analysis of AH-1 series Cobra helicopter swashplates, scissors and sleeves have already proven successful by detecting potential problems. A 12-month test for ferrographic analysis of intermediate and tailrotor gearboxes for nearly 35 AH-64 series Apache helicopters is being planned. The grease samples are analyzed at the Army's oil lab at CCAD. The analytical teardown of AOAP-removed components will be conducted at AIB for the analysis. The test objectives include the following questions—

- Should the internal conditions of the gearboxes using the ferrograph be monitored?
- Could ferrographic analysis be used as a permanent method for monitoring internal conditions of gearboxes?
- Can ferrography be used to establish time-between-overhaul criteria?

AOAP Policies and Procedures

Users can find a comprehensive description of the AOAP in the following publications—

- AR 750-1, *Army Materiel Maintenance Policy and Retail Maintenance Operations.*
- TB 43-0106, *Aeronautical Equipment Army Oil Analysis Program.* A major revision to this publication is underway. When completed, this revision will contain detailed information on the AOAP about Army Aviation.
- TB 43-0211, *Army Oil Analysis Program Guide For Leaders and Users.*

Army Aviation AOAP Manager

The AOAP is a cornerstone in the reliabilty centered maintenance program. AOAP provides a powerful tool for the Army's repertoire of diagnostic and predictive maintenance procedures.

Dr. Lewis Neri
DERSO
ATTN: AMSAV-MR
Corpus Christi Army Depot
Corpus Christi, TX 78419-6195;
AUTOVON 861-2023, Commercial 512-937-2023

Army Aviation AOAP Operating Labs

Commander
U.S. Army Infantry Center and Ft. Benning
ATTN: ATZB-DL-MA-Q, AOAP
Ft. Benning, GA 31905-5174

Commander
U.S. Army Air Defense Center and Ft. Bliss
ATTN: ATZC-DIM-QA, AOAP
Ft. Bliss, TX 79916-6024

Commander
18th Airborne Corps and Ft. Bragg
ATTN: AFZA-DL-MC, AOAP
Ft. Bragg, NC 28307-5000

Commander
101st Airborne Division (Air Assault)
ATTN: AFZB-DL-M-SO, AOAP
Ft. Campbell, KY 42223-5000

Commander
4th Infantry Division
ATTN: AFZC-DL-MQ, AOAP
Ft. Carson, CO 80913-5029

Commander
Corpus Christi Army Depot
ATTN: SDSCC-QLS, AOAP
Corpus Christi, TX 78419-6040

Commander
10th Mountain Division Light Infantry
AOAP
Fort Drum, NY 13602-5000

Commander
U.S. Army Training Center and Ft. Eustis
ATTN: AOAP Laboratory
P. O. Box 4581
Ft. Eustis, VA 23604-0581

Commander
III Corps and Ft. Hood
ATTN: AFZF-DL-MNT-AL, AOAP
Ft. Hood, TX 76544-5056

Commander
National Training Center
ATTN: AFZJ-DLM, AOAP
Ft. Irwin, CA 92310-5000

Commander
U.S. Armor Center and Ft. Knox
ATTN: ATZK-DL-M-Q, AOAP
Ft. Knox, KY 71459-5000

Commander
I Corps and Ft. Lewis
ATTN: AFZH-AOAP
Ft. Lewis, WA 98433-5000

Commander
7th Infantry Division and Ft. Ord
ATTN: AFZW-DL-MT, AOAP
Building 2390
Ft. Ord, CA 93941-5555

Commander
5th Infantry Division and Ft. Polk
ATTN: AFZX-DL-M, AOAP
Ft. Polk, LA 71459-5000

Commander
6th Infantry Division (L) DOL
ATTN: AFVR-DL-LQ, AOAP
Ft. Richardson, AK 99505-5700

1st Infantry Division and Ft. Riley
ATTN: AFZN-DL-ML, AOAP
Building 8100
Ft. Riley, KS 66442-5956

Commander
U.S. Army Aviation Center and Ft. Rucker
ATTN: ATZQ-DOL-SS, AOAP
Ft. Rucker, AL 36362-5114

Commander
U.S. Army Field Artillery Center and Ft. Sill
ATTN: AOAP
Ft. Sill, OK 73505-5100

Commander
24th Infantry Division and Ft. Stewart
Maintenance Division, Building 1128
ATTN: AFZP-DLM-QA, AOAP
Hunter Army Airfield
Savannah, GA 31409-5022

AOAP In Europe

U.S. Army Europe Materiel and Equipment Oil Analysis Laboratory
ATTN: AERAS-MU
APO NY 09028

U.S. Army Europe Oil Laboratory
Giessen Army Depot, Building 106
APO NY 09161

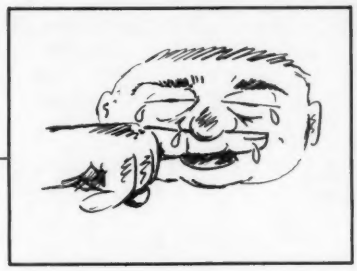
U.S. Army Europe Oil Analyses Laboratory
Muna-Installation-Bamberg
ATTN: AERAS-MU-B
Building 8527
APO NY 09139

Mobile AOAP Labs

U.S. Army Materiel Readiness Support Activitry (two labs)
Lexington Bluegrass Army Depot
Lexington, KY 40511-5101

AVIATION MEDICINE REPORT
Office of the Aviation Medicine Consultant

Use of Nonsedating Antihistamines for Army Aviation Applications



Major Darcelle M. Delrie, M.D.
U.S. Army Aeromedical Center
Fort Rucker, AL

ANTIHISTAMINES are associated with impaired central nervous system (CNS) functions, such as drowsiness and altered psychomotor performance. Therefore, the usefulness of antihistamines by aircrews has been limited by their sedative side effects and unacceptable decrements in performance. The introduction of nonsedating antihistamines arouses considerable interest because of their reported freedom from side effects.

Terfenadine (Seldane) was introduced by Merrell Dow Pharmaceuticals, Inc. in 1985 and astemizole (Hismanal), by Janssen Pharmaceuticals, Inc. in 1988. These new, selective antihistamines are devoid of sedative properties commonly associated with antihistamine therapy. Studies have shown them to be free of central nervous system side effects in pharmacological, toxicological and clinical studies. Clinically, these nonsedating antihistamines are effective for the relief of symptoms associated with seasonal allergic rhinitis (hay fever) and other histamine-mediated disorders.

The possibility of having available antihistamines that do not adversely affect performance or even slightly impair performance is important for aviation and military populations. This article identifies and addresses the issues about allergic rhinitis and using nonsedating antihistamines for Army Aviation applications.

H1-Receptor Antagonists (Antihistamines)

The H1-receptor antagonists, or H1-blockers, often referred to as the antihistamines, were introduced into clinical practice more than 40 years ago. Since then, personnel have used them extensively to provide symptomatic relief for allergic conditions. All of the so-called classical antihistamines have been effective in relieving the symptoms of allergic disorders. In fact, one can make only a slight distinction between them, because they all work the same way. However, these classical antihistamines have side effects that greatly reduce their therapeutic usefulness.

Antihistamines can both stimulate and depress the CNS. How the various drugs produce their depressant and stimulant effects is uncertain. The drugs bind with high affinity to H1-receptors in the brain and the effects may reflect antagonism, or blocking, of the H1-receptors in the brain.

Central depression usually accompanies therapeutic doses with diminished alertness, slowed reaction

times and somnolence (sleepiness) as common manifestations. Occasionally, patients given conventional doses become stimulated and become restless, nervous and unable to sleep.

Some antihistamines are more likely to depress the CNS than others, and patients vary in their susceptibility and responses to individual drugs. Diphenhydramine (Benadryl), for example, causes somnolence or drowsiness in about half of those taking the drug. Other, and perhaps unrelated, central actions include the ability of certain antihistamines to counter motion sickness and vertigo.

Drowsiness associated with antihistamines has been attributed to various mechanisms; however, sedative effects seem dependent on the ability of a particular drug to cross the blood-brain barrier and gain access to the CNS. A common property of many antihistamines is the ease in which they cross the blood-brain barrier.

However, some compounds cross the blood-brain barrier only with great difficulty. These compounds, such as terfenadine and astemizole, appear to have little association, if any, with impaired central nervous function. The lack of CNS side effects with terfenadine and astemizole probably is due to their poor penetration into the CNS.

Allergic Rhinitis and U.S. Army Aviators

Allergic rhinitis, or hay fever, is a continuous problem that has plagued the military aviation population for many years. Associated hay fever symptoms include sneezing, rhinorrhea (runny nose), pruritus (itching) and lacrimation (tearing). Nasal allergies are extremely common between 5 and 20 percent of the population.

Allergic rhinitis has the potential for medically incapacitating aviators. Aviators tolerate the bothersome and distracting symptoms of allergic rhinitis. Aviators, in particular, are at an increased risk of developing barotitis (ear block); barosinusitis (sinus block); and alternobaric (pressure) vertigo during flight due to edema, or swelling, and congestion secondary to allergic rhinitis.

Ear and sinus blocks, which can develop suddenly, can produce excruciating pain. Pressure vertigo with its spinning sensation can create disorientation. The aeromedical significance of developing any of these problems is obvious: each problem can cause sudden inability in the aviator to fly the aircraft.

Many of the medications and treatments of allergic rhinitis are contraindicated in the flying-status patient. Therefore, the aviation community represents a difficult group of patients to treat adequately.

Flight personnel may hide the problem or seek medical treatment from sources that do not understand the dangers that certain medications present in the flight environment. Some flight personnel self-medicate with antihistamines and other drugs they purchase over the counter—even though this clearly violates Army Regulation 40-8, *Temporary Flying Restrictions Due to Exogenous Factors.*

Allergic rhinitis is best considered an immunologic disorder that separates into *seasonal* allergic rhinitis (hay fever) and *perennial* allergic rhinitis. Seasonal allergic rhinitis patients are sensitive to specific molds and pollens only present during specific seasons. Perennial allergic rhinitis patients are sensitive to those substances, such as house dust, animal dander and, infrequently, foods. The patient with seasonal allergic rhinitis has specific episodes that resolve after seasonal or residential changes. The patient with perennial allergic rhinitis has symptoms throughout the year.

Most patients blame their symptoms on chronic "colds" or "sinus problems" when, in reality, their underlying problem is allergic rhinitis. Other symptoms include the description of postnasal drainage and the frequent "sore throat." Many patients also develop symptoms of allergic conjunctivitis with complaints of tearing, itching, burning eyes and feelings of pressure around the periorbital (eye) areas.

Personal histories and facial appearances often help medical personnel readily diagnose patients with significant allergies. Many patients may demonstrate the "allergic salute," a maneuver using the palm of the hand to rub the nose upwardly and outwardly. This relieves the itching and often results in a transverse crease across the lower third of the nose. Venous stasis and congestion may cause "allergic shiners," the dark circles under the eyes. Extremely common problems include infraor-

bital edema (swelling under the eyes); dark discoloration of the lower lids; pale, boggy mucosa on both the septum and the turbinates of the nose; and a mucoid rhinorrhea (clear runny nose). Severely atopic (allergic) individuals are excluded from the aviator community; however, many aviators do suffer from mild perennial or intermittent seasonal allergic rhinitis and perform very satisfactorily on flight status.

The best treatment for allergic rhinitis is avoiding the allergen. However this may be next to impossible. Avoiding overexposures to heavy pollen loads, cleaning as much house dust as possible and avoiding animal dander are helpful. Still, these treatments do not offer significant relief to the patient suffering from an acute episode of allergic rhinitis. The most common treatment for allergic rhinitis is using decongestant and antihistamine combinations. However, these medications are only partially effective and have been contraindicated in aviators in the past due to the sedative side effects.

According to AR 40-501, *Standards of Medical Fitness*, allergic rhinitis disqualifies a person for aviation duties—unless the hay fever is mild and considered unlikely to limit flying activities. The decision to allow aircrewmembers with allergic rhinitis to continue to fly is based on the severity and frequency of symptoms and the need to use antihistamines.

Waivers

The Army currently allows flight personnel, who are on flight status and treated by a flight surgeon, the occasional use of the decongestant pseudoephedrine (Sudafed) without waiver. This is allowed for personnel whose minimal rhinitis symptoms do not interfere with flying duties.

When significant disease exists, aviators may get waivers for the allergic rhinitis and its treatment. However, the individual needs to control the symptoms with no significant adverse effects according to Aeromedical Policy Letter 14-87, Allergic Rhinitis and Desensitization Therapy.

Waivers may be considered for flight personnel who choose to undergo desensitization therapy (allergy shots) and whose symptoms are controlled by the immunotherapy. Desensitization with allergen extracts (allergy shots) has been effective in relieving many of the symptoms in a large percentage of the aviation population.

Waivers may be given for the use of the topical nasal steroid sprays, beclomethasone diproprionate (Vancenase or Beconase) and flunisolide (Nasalide). Nasal steroid sprays are reasonably effective due to their high degree of topical activity and essentially have no adverse systemic effects.

In addition, aviators may get waivers for the use of the topical nasal spray, cromolyn sodium (Nasalcrom). Cromolyn sodium, a topical mast cell stabilizing medication, prevents the release of histamine. Pretreatment with cromolyn sodium, a reasonably effective treatment, is not contraindicated in the aviator community due to its lack of systemic effects.

The usual treatment of allergic rhinitis with the classical sedative antihistamines makes continued flight unacceptable. Furthermore, AR 40-8 specifically restricts the performance of aircrew duties while aviators take the typical antihistamines.

Until recently, the flight surgeon had little to offer the aircrewmember in need of antihistamines because of the antihistamine's sedative side effects. With the introduction of terfenadine and astemizole as nonsedating antihistamines, the flight surgeon now may have the tools needed to care for aviators. These aviators would benefit from the use of antihistamines without suffering the sedative side effects.

In 1986, under the recommendation of the U.S. Army Aeromedical Center (USAAMC), the Department of the Army (DA) and National Guard

Bureau (NGB) began to waive the new nonsedating antihistamine, terfenadine, for use in aircrewmembers. USAAMC only recommends waivers; DA or NGB is the waiver authority. Therefore, Army aircrewmembers with waiver can now use terfenadine.

Nonsedating Prescriptions

Current plans of the U.S. Army Medical Research and Development Command (USAMRDC), Ft. Detrick, Frederick, MD, include an applied research program. The program will use the UH-60 Black Hawk flight simulator at the U.S. Army Aeromedical Research Laboratory (USAARL), Ft. Rucker, AL. The program will evaluate the effects of terfenadine as a nonsedating antihistamine on flight performance.

In conjunction with this program, Virginia Polytechnic Institute, Blacksburg, VA, is under contract with USAMRDC. The institute will evaluate the effects of astemizole as a nonsedating antihistamine on complex cognitive performance. These studies will attempt to validate terfenadine and astemizole as nonsedating antihistamines for use within the aviation and military environment.

With studies completed and results established, and barring any unforseen occurrence, USAAMC may allow aviators to use these nonsedating antihistamines without a waiver. Then they could get these nonsedating antihistamines with only a prescription from the flight surgeon, as they already do to obtain Sudafed.

Thus, these nonsedating antihistamines would benefit Army Aviation personnel who are reluctant to come forward and have their allergic rhinitis diagnosed as medically disqualifying. This reluctance may well be justified. This implies many aircrewmembers probably have only minimal allergic rhinitis symptoms that do not interfere with flying duties. Also, these aviators may benefit significantly from the occasional use of these nonsedating antihistamines. These individuals currently control their symptoms with Kleenex, handkerchiefs, sleeves and the occasional use of Sudafed.

At present, flight surgeons are prescribing terfenadine for aircrewmembers on flight status who have waivers for their allergic rhinitis and for the use of terfenadine. One may consider allergic rhinitis that requires using antihistamines, topical nasal medications or immunotherapy: this is still a condition that needs a waiver and a situation that aviators should not consider minimal. Significant allergic rhinitis and its therapy are disqualifying. But fortunately, the therapy controls the disease and is effective and safe for use in aviation. Thus waivers are readily granted for these disqualifications.

No longer should aircrewmembers feel reluctant to seek the aid of their flight surgeon for their rhinitis symptoms, such as sneezing, runny nose, itching and tearing. No longer do aircrewmembers need to control their allergic rhinitis symptoms with only Kleenex, handkerchiefs, sleeves and the occasional use of Sudafed.

The efficacy of terfenadine and astemizole in allergic rhinitis and histamine-mediated skin disorders has been demonstrated clearly. Both drugs offer an important advantage over traditional antihistamines: they lack CNS side effects, particularly sedation.

Although one may consider other clinical factors, the question now arises as to whether aviators involved in skilled activity can safely use nonsedating antihistamines. However, in the critical situation of aviators, any possibility of anyone having unusual reactions or side effects during the initial use of terfenadine and astemizole must be excluded.

As with any other medication, aviators should first use terfenadine and astemizole with caution. Aviators should begin treatment when they are in a nonflying status. Barring unexpected findings, nonsedating antihistamines, such as terfenadine and astemizole, could well become the "drugs of choice" for those soldiers involved in any skilled or hazardous activity in which alertness is crucial to performance. These soldiers include aviators who indicate a need for antihistamines.

The Aviation Medicine Report is a bimonthly report from the Aviation Medicine Consultant of TSG. Please forward subject matter of current aeromedical importance for editorial consideration to U.S. Army Aeromedical Center, ATTN: HSXY-ADJ, Fort Rucker, AL 36362-5333.

PEARL'S

Personal Equipment And Rescue/survival Lowdown

Walk-Around Restraint Harnesses Help Prevent Accidents

Warning. The walk-around restraint harness is not designed for, nor intended to be used in place of, a seatbelt. The purpose of the walk-around restraint harness is to allow aircrewmembers in flight to work around open doors without anyone falling out of the aircraft. Therefore, the aircrewmember must adjust the pigtail to a length that allows free movement within the aircraft. This same length must not go beyond the door opening.

In the event of an accident, the walk-around restraint harness will not prevent injury. When not required to walk, aircrewmembers should sit down and use seatbelts.

Point of contact is Mr. James Dittmer, AUTOVON 693-3573 or Commercial 314-263-3573.

Back To Basics

Recent phone calls from the field indicate aviation life support equipment (ALSE) technicians need to go back to basics to inspect and perform maintenance *by the book.*

Survival Vests. The SRU-21/P survival vest includes an optional survival knife. The location of the knife on the vest (as shown in TM 55-1680-317-23&P, *Aviation Unit and Aviation Intermediate Maintenance Manual with Repair Parts and Special Tools List for Army Aircraft Survival Kits,* paragraph C-18) is mandatory with *handle up, blade down* and next to the PRC-90 radio pocket. This position is the safest. If one has the knife positioned up on the shoulder with the handle down and the blade up, that individual will look at serious facial injuries during a crash sequence.

Survival Kits. When the ALSE technician secures the slide fastener thong, that individual uses the same method shown in TM 55-1680-317-23&P, figure 2-9a on page 2-50. The note on page 2-49 tells one how to sew the tac stitches. The aircrewmember should not use plastic cable ties or safety wire to secure the slide fastener thong, but instead should use the prescribed method. The aircrewmember should not remove any mandatory item from any survival kit and replace it with anything, even if the replacement is almost like the original. One can add but not replace mandatory items to a survival kit.

Aircraft First Aid Kits. Referencing lead seals and prescribed methods in TM 55-1500-

204-25/1, *General Aircraft Maintenance Manual*, change 37, tells how to use the lead seals to secure the aircraft first aid kit. Aircrewmembers should not use nylon seals or fasteners, because no one can break the ties with less than a 8- to 12-pound pull. Most often, one will need a pocket knife to cut the plastic/nylon seal.

SPH-4 Helmet. ALSE technicians are not performing the SPH-4 helmet maintenance and inspections *by the book*. Inspections have shown that helmets have improper ear cushions. The correct ear cushion, however, has the "bump" on it. This bump is positioned at the bottom of the ear in the valley of the outer lobe. The bump does not build up sweat on hot days.

The donut that belongs in the CVC helmet suspension assembly does not belong in the SPH-4 suspension assembly. If parts are not in the SPH-4 helmet manual, they do not belong in or on the SPH-4 helmet.

Aircrewmembers should help themselves by going *by the book* while they inspect or repair. In the long run, each person helps the other by having a good and safe ALSE program that later means successful Aviation Resource Management Survey inspections. Point of contact is Mr. Jim Angelos, AUTOVON 693-3574.

If you have a question about personal equipment or rescue/survival gear, write PEARL'S AMC Product Management Office, ATTN: AMCPM-ALSE, 4300 Goodfellow Blvd., St. Louis, MO 63120-1798 or call AUTOVON 693-3573 or Commercial 314-263-3573.

U.S. Army Class A Aviation Flight Mishaps

	Number	Flying Hours	Rate	Army Fatalities	Total Cost (in millions)
FY 89 (through 30 June)	26	1,353,187	1.92	28	$100.9
FY 90 (through 30 June)	25	1,382,934*	1.81	31	$111.0

*estimated

The new Aircrew Integrated Helmet System has a star war's appearance. The U.S. Army Aviation Development Test Activity, Ft. Rucker, AL, finished testing the system in February.

Seeing Better in the Dark

Captain Mark R. Pedron

CPT Mark R. Pedron was attending the Aviation Officer Advanced Course 89-3, U.S. Army Aviation Center, Ft. Rucker, AL, when he wrote this article.

"HAVE YOU GOT the wires? Come on, can you see the wires at 300 meters?" asked CW3 Hudson.

"OK, I think I've got 'em. Just let me adjust this left tube," replied 2LT Johnson.

The above dialogue could be heard during any night vision device (NVD) training flight at the U.S. Army Aviation Center, Ft. Rucker, AL. However, this conversation, or one just like it, will now take place in a classroom. The Aviation Center has established the first NVD training and operations facility. The facility is designed to enhance the current NVD training at the Aviation Center. This training also provides the field commander with a more qualified and better trained pilot.

History

Between 1974 and 1988, there were numerous accidents during NVD flights. More than 120 aircraft and 64 lives were lost. There was a total dollar cost of $139 million. Pilot error was named as the major contributing factor in most of these accidents.

A review of aviation accidents revealed that there are some misunderstandings among pilots on the use and limitations of NVDs. The command at the Aviation Center felt that to correct this deficiency the initial aviation student needed more ground and classroom instructions on the proper use of NVDs.

Currently, NVD instruction is taught in three environments: the student is familiarized with the NVDs in a classroom, performs cockpit operations in the flight simulator and then is taught to fly with devices in the aircraft.

With this three-step method, there was no hands-on practical exercise during academics for the student to see the limitations and hazards of NVD flight before actual flight training.

In 1987 the commander of the Aviation Center, concerned with the NVD training deficiency, visited the Marine Aviation Weapons and Tactics Squadron-One (MAWTS-One) in Yuma, AZ. At MAWTS-One, the Marines had contracted for a night training classroom. The Marine Corps Night Imaging and Threat Evaluation (NITE) Laboratory provided the Marine Corps aviators with basic operation, limitations and introduction to NVDs and their vulnerabilities to laser warfare. The lab was divided into four rooms: the eye lane (focus/calibration) room for basic operation and adjustment; the terrain board room for viewing of night flight hazards with NVDs; the laser threat room for viewing the vulnerabilities of the devices during laser operations; and the near-infrared (IR) video projection room for viewing flight footage wearing the devices.

The commander was so impressed with the NITE Laboratory that he directed the Aviation Center to build a similar facility. The Directorate of Plans, Training, Mobilization and Security acted as lead agency, along with the Directorate of Combined Arms Tactics, now the Directorate of Tactics and Simulation (DOTS), in the construction of the facility. The DOTS teaches NVD academics.

Facility Description

The Night Vision Device Training and Operations Facility exposes aviators to the full spectrum of possible flight conditions in a low-risk environment. The facility is made up of three classrooms, and each has a different training focus. The three rooms are the eye lane room, the terrain board room and the projection room.

The eye lane room is dedicated to introducing and familiarizing students to NVDs. The students learn to fit, adjust and operate the AN/AVS-6 and AN/PVS-5 NVDs. Using high and low contrast tribar resolution charts, students are taught the proper procedures for focusing the NVDs. In addition, basic limitations and emergency procedures are briefed at the facility.

In the terrain board room, students view controlled variations on moon illumination and angles. Round terrain boards are furnished with known flight hazards, which allow students to view such hazards as wires and antennas in low illumination conditions.

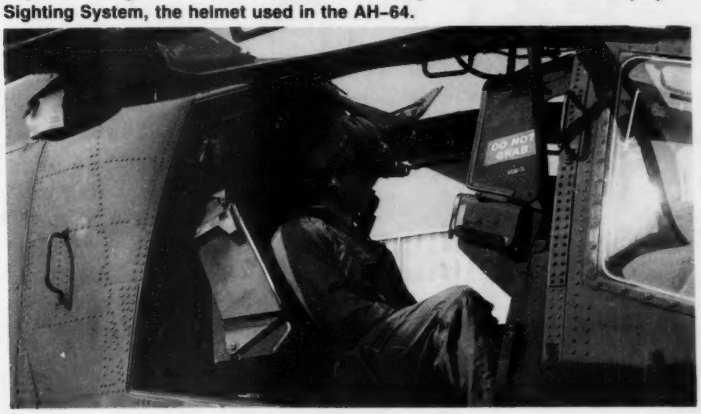
In the projection room, students, while wearing NVDs, view near-IR films depicting a wide variety of flight conditions. Any condition associated with NVD flight can be filmed during daylight hours, then projected through a near-IR projection system. These conditions include basic flight maneuvers; nap-of-the-earth, low-level and contour flight; formation flight; lead changes; confined area operations and flight hazards.

Training Scope

Each year, the Night Vision Device Training and Operations Facility trains 3,600 students in 23 U.S. Army Aviation Center courses of instruction. Instruction at the facility enhances the current curriculum of NVD instruction.

With the introduction of this safety foundation before an actual NVD flight, we should have better qualified pilots to fly in the high-risk night environment. The end result of this training translates into students who are better prepared to fly a variety of NVD missions, safely!

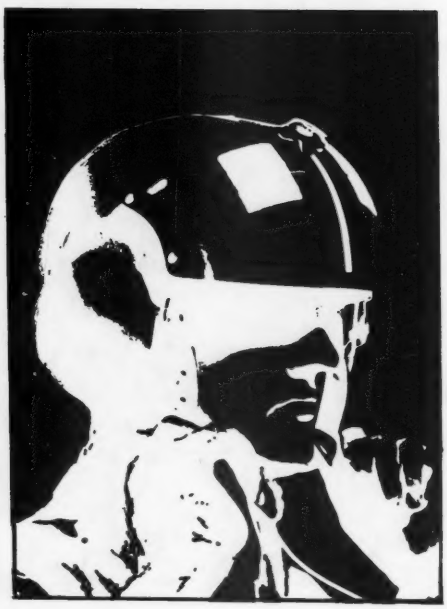
Captain George V. Dimitrov wears the Integrated Helmet and Display Sighting System, the helmet used in the AH-64.



Nothing Mysterious About What Makes a Good Pilot

MAJ Lauran Paine Jr.

Major Lauran Paine flies for Horizon Airlines, and is an OV-1 Mohawk pilot with the Oregon National Guard. Reprinted with permission of *Western Flyer*/General Aviation.



BEING fairly senior at my airline, I was one of the first to get checked out in a new type airplane the company had purchased. The airline then asked me to become a check airman in the new aircraft. I had always, in the past, turned down such requests. Training was just not my "thing." At any rate, being "company man" and being sensitive to their need, this time I said yes. From this inauspicious beginning the way was paved for some new learning, for which I am now grateful. In my new position I had the opportunity to fly with and check out some very experienced captains. After awhile I began to notice the good ones had certain characteristics very much in common. I took notes and I think those characteristics are important to pass on. We can learn much that is important from good pilots.

One of the things I learned is that the best ones are not the most demonstrative ones. In other words, they are not the loudest ones at the bar. They are outgoing people but fairly introspective about their work; they are what psychologists would call controlled extroverts. Thus most of what I learned from them was in the watching. What follows is what I saw in common among the good ones.

The good ones prepare. They come to the task ready to fly. They know what is expected of them and they prepare to meet those expectations. They know their limitations; they know their aircraft's limitations. And they do not cut corners.

The good ones plan ahead. I could easily have said, "The good ones plan way ahead," because they do. They are seldom caught by surprise; while involved in one event they already have another plan in mind if the present one does not work out. Their "war stories" are usually only ones of some mechanical failure because they plan ahead such that they seldom, if ever, put themselves in a position to fail.

The good ones know and respect the weather. The good ones *study* the weather before they go; they

are aware of worst case scenarios and plan accordingly. Simply put, they just do not leave weather to chance. And they *avoid* the really bad stuff like root-canal work.

The good ones look outside a lot. Almost constantly! They scan inside but, VFR, their attention is outside. Cockpit duties are done so that no one thing keeps their heads down for extended periods of time. In other words, when flying, they are heads-up people.

The good ones never seem to get excited. The good ones do not rattle easily; they just sort of work through things, bit by bit, until they get the situation under control. They exude a rather quiet confidence in most all situations. I guess it follows, then, that that's why the good ones are generally very smooth; no jerky, rapid control movements from these pilots, just constant attention and gentle pressures.

The good ones are aware of their surroundings. They know where other IFR traffic is and where they are fitting in the big picture. The good ones even anticipate the controller's needs and are courteous and helpful to them as well as to other pilots. The good ones never think they are the only airplane in the sky.

The good ones are brief on the radio. The good pilots know what the controller needs to know and will say in one call what many take three calls to say. And the good ones, when given a frequency change, never rudely reply, "Bye."

The good ones have a feel for their airplane. The good ones just seem to know where their airplane is, insofar as how it is flying, at all times. Their maneuvers are never in doubt. They are the master of their craft; the craft never flies them. It follows that the good ones are out flying; you do not get a feel for an airplane sitting in an office talking about it.

The good ones are proud. I wanted to say the good ones are not wimps but that gives poor connotation in print. By wimp, I mean too timid. One can be so timid as to say no to everything; that is safe but accomplishes little. The good pilots get the job done. They will go to the limit but that is because they know what the limit is. They use—but do not abuse—limits. Minimums are sacred to them.

The good ones are safe. It follows that pride never gets in the way of being safe. They will get the job done—if it can be done—but with safety first.

The good ones do not mind checkrides. Really! For the good pilots it is an opportunity to show their stuff. In fact, if after a checkride, you mention an area of concern to them they already know what they did (and probably know some things they did that you did not even catch). The good ones set their standards much higher than the minimums, yet they remain open minded to new techniques.

The good ones take care of themselves. They just understand that when they are healthy they perform better. They go to some lengths to stay healthy both physically and mentally. They have the courage and intelligence to not fly when they know they are not up to flying.

The good ones read. Yeah, they are always reading about aviation. Newspaper articles, magazines, books; if it has to do with airplanes they are interested. That interest pays them dividends. They are aware of all aspects of their industry. It is an awareness that pays; they are always up to date.

The one word I would pick to sum up the good ones would be *professional*. Flying is what they do and they do it well. (The type airplane is immaterial; they are professional in any airplane.)

Many will read themselves into the characteristics of the good ones when in reality there are but few. But is that not one of the beauties of aviation? It is always challenging. We have yet to fly the perfect flight but we should always be out there trying. That is what the good ones are doing.

Above and Beyond the Call of Duty

Corporal Ruben Santos
Department of Enlisted Training
U.S. Army Aviation Center
Fort Rucker, AL

CONGRESS ESTABLISHED the Medal of Honor in 1862. This medal is to be given for "a deed of personal bravery or self-sacrifice above and beyond the call of duty while a member of the Armed Forces in actual combat with an enemy of the Nation." The roll of honor includes 3,394 of the tens of millions of men and women who have served their country in the time of need since the Civil War. Among them are the names of generals and privates alike—Americans of every color and creed from every corner of this vast land. As a symbol of heroism, it has no equal in American life. General George S. Patton once declared, "I'd give my immortal soul for that decoration."

Medal of Honor photo by Oscar Porter

But the Medal of Honor is earned in action at the risk of a soldier's life. The medal is not given for ordinary bravery. Fighting men are expected to be brave. That is part of their duty and the Medal of Honor is given only to the bravest of the brave. Special Forces Sergeant (SGT) Roy P. Benavidez was one of the men willing to put his duty, his country and the welfare of his comrades above himself.

A 12-man Special Forces reconnaissance team had been inserted 48 kilometers inside Cambodia on a Top Secret intelligence gathering mission. Standing inside the radio shack at Loc Ninh, Cambodia, on 2 May 1968, SGT Benavidez was amazed at the sound of gunfire coming over the radio. SGT Benavidez rushed to the helicopter pad and jumped into a UH-1 Huey helicopter as it readied for takeoff. Over the border, enemy fire, which was too heavy to allow the Huey to land near them, sur-

rounded the men on the ground. The pilot reached another clearing 75 yards away and SGT Benavidez jumped out, running toward the American position.

Enemy fire poured at him from trees and bushes all around. SGT Benavidez felt the bullets go into his legs and face. The fire knocked him down several times, but he kept on going. Reaching the team, SGT Benavidez found four men dead and eight others wounded. When the helicopter touched down, a few Americans climbed aboard while SGT Benavidez ran to retrieve classified documents and a camera. While returning, SGT Benavidez was shot in the back and knocked down. Looking up, he saw the helicopter crash and burn after being hit by sniper fire. He ran to the aircraft and pulled out two crewmen, then led them to the others and established a small defensive perimeter.

By now, he was bleeding heavily from bullet wounds all over his body. One man begged SGT Benavidez to kill him, but the sergeant told him to "shut up. We don't have permission to die!" SGT Benavidez and the others were on the ground almost 8 hours. During that time, several helicopters were shot down trying to evacuate the men. Finally, one helicopter landed nearby. SGT Benavidez was taking the men to the aircraft when he was struck on the back of the head by a rifle butt. Wheeling around he saw a North Vietnamese soldier thrusting a bayonet toward his midsection. SGT Benavidez grabbed the blade, cutting open his hand, then pulled the man to him and stabbed him with his knife. Finally, he was pulled aboard and collapsed near the pile of bodies inside. As the Huey rose, blood trickled out its side doors.

SGT Benavidez slowly recovered from his wounds and was discharged from the Army in 1976. He was credited with saving eight of the men's lives. Finally, on 24 February 1981, almost 13 years after the episode in Cambodia, President Ronald Reagan awarded Master Sergeant Roy P. Benavidez the Medal of Honor. He was the last living man to receive the medal for the Vietnam War.

Down through the years the medal has remained the highest symbol of honor and bravery. To their peers and to millions of Americans, Medal of Honor recipients are the Nation's heroes, the "bravest of the brave." President Harry S. Truman often told the men to whom he presented the Medal, "I would rather have that medal than be President of the United States."

A Stamp for Army Aviation's 50th Anniversary

Captain William P. Shea
1st Battalion, 169th Aviation Regiment
Connecticut Army National Guard

THE DATE IS 6 June 1992. Thousands of people are on the parade field in front of the Ft. Rucker, AL, post headquarters. They are participating in the celebration of Army Aviation's 50th anniversary. Cabinet officials, senators, congressmen, generals, old and new aviators and the U.S. Postmaster General are among the dignitaries assembled for this historic event.

Why is the U.S. Postmaster General at Army Aviation's 50th anniversary celebration? Why, to participate in the first day of issue ceremony for the commemorative stamp honoring Army Aviation's 50th anniversary.

The issuance of a stamp commemorating Army Aviation's 50th anniversary is very much a possibility. For this to become a reality, it will require a great deal of support. The support must come from groups, associations, politicians, corporations and individuals. Individual support must come from people like you—*U.S. Army Aviation Digest* readers and Army Aviation supporters.

Long ago, the U.S. Government recognized that postage stamps are an effective means of communicating to a broad international audience. U.S. commemorative stamps affixed to envelopes, packages and postcards are highly visible. They recall outstanding individuals, celebrate historical events, highlight important current events and focus attention on important issues.

A commemorative stamp is issued to honor an important event, person or special subject. Army Aviation's 50th anniversary is an example of such an event. Commemorative stamps are usually larger and more colorful than regular postage stamps. Normally, they are available only in limited quantities and usually for only a short time.

The U.S. Postal Service (USPS) Stamps Division controls the commemorative stamp program. They receive between 20,000 and 30,000 suggestions for commemorative stamps each year. The Postmaster General established the Citizens' Stamp Advisory Committee in 1957 because of the great influx of suggestions.

The committee is comprised of 13 citizens. They represent a cross section of backgrounds that include historians, artists, businessmen, stamp collectors and other individuals interested in American history and culture. The USPS Stamps Division presents about 1,500 recommendations for commemorative stamps to the committee each year.

The committee meets six times a year to review each of the proposals. They rate each proposal on an equal basis and make their decisions based on majority votes. The committee conducts its proceedings in private. The reasons for their decisions are not made public. The committee forwards their recommendations to the Postmaster General. Between 25 and 30 of these recommendations become stamps each year.

The committee considers each proposal based on a set of stamp selection standards. Among the standards are those for historical anniversaries. They consider historical anniversaries for stamp subject selection on even date anniversaries. They prefer to start with the 50th anniversary and each 50-year interval thereafter. The committee considers subjects and events only if they are of widespread national interest and appeal. Army Aviation's official birthdate is 6 June 1942. Aviation became an organic part of Field Artillery on that date. Army Aviation's 50th anniversary is 6 June 1992. The date and event meet the consideration criteria for a commemorative stamp based on the established standards of stamp selection.

The USPS has issued two stamps similar to the one proposed for Army Aviation. On 1 August 1957, they issued a 6-cent airmail stamp commemorating the Air Force's 50th anniversary. That stamp depicted a B-52 Stratofortress and three F-104 Starfighters. The USPS issued a similar stamp on 20 August 1961 depicting Naval aviator wings and the Navy's first plane—the Curtis A-1. That stamp commemorated Naval Aviation's 50th Anniversary.

There are now more than 45 proposals before the Citizens' Stamp Committee for a stamp commemorating Army Aviation. Now is the time for us, in the Army Aviation community, to express our desires to the USPS.

One way to support the effort for a 50th Army Aviation anni-

versary stamp is by petition. A petition is a method of showing widespread public interest and support for a specific subject. Public interest in a specific subject is one of the criteria from the standards of stamp selection that guides the committee in its selection of stamp subjects. The USPS's current policy is to neither encourage nor discourage the use of petitions to support proposals.

At the right of this article is a prepared petition for submission to the Citizens' Stamp Advisory Committee. Tear it out and make copies. Get as many Army Aviation supporters as possible to sign the petitions and forward them to the committee.

I encourage those of you who feel this proposal has merit to write the Citizens' Stamp Advisory Committee. Urge them to give their full consideration to recommending to the Postmaster General a stamp for Army Aviation's 50th Anniversary.

The year 1992 is not that far away. The consideration for stamps to be issued in 1992 will be finalized shortly. Do not delay in submitting your letter or petitions to the Citizens' Stamp Advisory Committee. Mail your letter or petitions to: Citizens' Stamp Advisory Committee, Stamps Division, United States Postal Service, 475 L'Enfant Plaza SW, Washington, DC 20260-6753.

A commemorative stamp is a superb way to usher in Army Aviation's second 50 years and to honor the first 50 years. Take a few minutes and write a letter or fill out a petition. A commemorative stamp will honor Army Aviation's contributions to our nation's history. It will make Army Aviation's 50th anniversary an event that will last forever. I'll look for you on the parade field on 6 June 1992. Army Aviation—Above the Best!

PETITION

For a commemorative stamp or block of four stamps honoring Army Aviation's 50th Anniversary.
We, the undersigned, hereby request the Citizens' Stamp Advisory Committee (U.S. Postal Service) give its full consideration to the various proposals for a stamp or block of 4 stamps honoring on 6 June 1992 U.S. Army Aviation's 50th Anniversary.

NAME	ADDRESS

Mail completed petition to: Citizens' Stamp Advisory Committee, Stamps Division, United States Postal Service, 475 L'Enfant Plaza SW, Washington, DC 20260-6753.

DES Equivalency Evaluations

Captain Joseph R. Goggins
Flight Standardization Division
Directorate of Evaluation and Standardization
U.S. Army Aviation Center
Fort Rucker, AL

USERS HAVE BEEN asking the Directorate of Evaluation and Standardization (DES) about instructor pilot (IP) and instrument flight examiner (IE) equivalency evaluations. The reason, of course, is due to recent budget constraints, personnel shortages and nonavailability of military occupational speciality-producing courses.

The following shows required procedures for DES to conduct an IP/IE equivalency evaluation. Each person desiring an equivalency evaluation must apply separately. Units requesting evaluations must provide temporary duty funding for the evaluator. Applicants must meet all requirements for the U.S. Army Aviation Center (USAAVNC) course as outlined in DA Pamphlet 351-4, *Army Formal Schools Catalog*. Applicants must show they meet the prerequisites. For example, applicants should attach DA Form 759, standardization instructor pilot (SP) recommendation and IE recommendation for IE equivalency, to the application.

SP/IE recommendations will include verification of proficiency in executing and teaching all base and special tasks, both day and night (unaided and aided). The SPs and IEs will be identified in the appropriate USAAVNC program of instruction (POI) and flight training guide (FTG) or aircrew training manual (ATM) supplement. The requesting unit makes sure all equipment required for the evaluation operates.

The individual's commander should apply through the chain of command and Commander, USAAVNC, ATTN: ATZQ-ESF, Ft. Rucker, AL 36362-5214, to Headquarters, Department of the

Army (HQDA), ATTN: DAMO-TRS, Washington, DC 20310-0450.

The commander must request the major Army command aviation office to contact the DA Commissioned Aviation Branch, AUTOVON 221-7822/9366, or Warrant Officer Branch, AUTOVON 221-7835/7836, for concurrence on the individual. Applications must include the U.S. Total Army Personnel Command approval.

Applications should include the following: name; grade; social security number; unit; flight hours; name of aircraft; and justification why the aviator cannot attend formal instruction. Fixed-wing aviators must comply with and document completion of the provisions of Field Circular 1-218, pages 2-15 and 16, table 2-4.

The DES standardization instructor pilot conducts the 3-day IP evaluation. The first day consists of written and oral examinations for contact and tactics (day, aided and unaided). The second day consists of the day portion of the flight and oral examinations according to the correct task lists. At a minimum, the flight evaluation includes all tasks listed in the correct USAAVNC POI and FTG or ATM supplement. The third day consists of the aided and unaided night portion of the evaluation.

A commander must justify a request for the applicant to forgo the night vision goggles (NVG) evaluation. Justification may include, for example, the unit does not have NVGs or the unit's mission does not require using NVGs.

Upon successful completion of the written, oral and flight evaluations, the examinee is designated as an IP in the applicable aircraft category.

The DES instrument flight examiner conducts the 3-day IE evaluation. The first day consists of the Rotary-Wing Instrument Flight Examiner Course (RWIFEC) examinations. The second day consists of a pilot instrument proficiency evaluation that parallels the RWIFEC Stage I evaluation. As a minimum, the examinee performs all flight tasks from the pilot's station. The third day of the evaluation consists of a left/front seat instrument instructor/instrument flight examiner proficiency evaluation. This evaluation parallels the RWIFEC Stage II and Stage III evaluations. As a minimum, the examinee performs all flight tasks from the copilot's/gunner's station.

All oral and flight evaluations are according to chapter 7 of the correct ATM. The evaluation tasks include all additional tasks specified as mandatory for evaluation in the RWIFEC flight training guide/program of instruction. Upon successful completion of the written, oral and flight evaluations, the examinee is designated as an IE in the applicable aircraft category.

The evaluation ends if any individual fails any prerequisite or any portion of the examination. No one takes equivalency re-evaluations. An individual who fails any portion of the evaluation must attend the resident course to obtain initial IP/IE designation.

DES provides, upon request, a memorandum of instruction for this procedure that includes supplemental information on the required paperwork. Users can requests POIs, FTGs and ATM supplements from the Commander, USAAVNC, ATTN: ATZQ-TSD, Ft. Rucker, AL 36362-5214, AUTOVON 558-5990/3283. Users can direct questions about the IP/IE equivalency evaluations to Commander, USAAVNC, ATTN: ATZQ-ESF, Ft. Rucker, AL 36362-5214, AUTOVON 558-3504/6309.

DES welcomes your inquiries and requests to focus attention on an area of major importance. Write to us at: Commander, U.S. Army Aviation Center, ATTN: ATZQ-ES, Fort Rucker, AL 36362-5208; or call us at AUTOVON 558-3504 or Commercial 205-255-3504. After duty hours call Fort Rucker Hotline, AUTOVON 558-6487 or Commercial 205-255-6487 and leave a message.

ATC FOCUS
U.S. Army Air Traffic Control Activity

Next Generation Weather Radar Looks Into Severe Weather

Mr. Dave Fonda
U.S. Army Air Traffic Control Activity
U.S. Army Aviation Center
Fort Rucker, AL

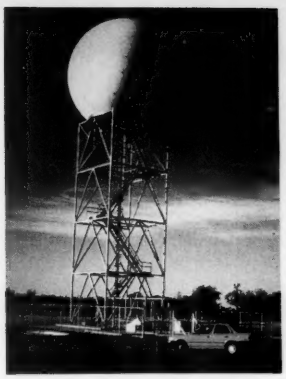
WE IN THE Army Aviation community care how severe weather affects air and ground operations and flight safety in the terminal and en route flying environment. Severe weather has lashed numerous Army airfields in the United States in the past decade. Thunderstorms with associated high winds, hail, lightning and tornadoes have accounted for extensive damage to aircraft, navigational aids and airfield structures. Even though we cannot control the weather, we can enhance our capability to predict it and protect our valuable resources.

The next generation weather radar (NEXRAD) is being fielded. Major Army airfields worldwide serviced by U.S. Air Force Air Weather Service (AWS) personnel will receive NEXRAD components. These components will enhance local weather forecasting and severe storm prediction. This state-of-the- art weather radar system, capable of detecting, analyzing and predicting severity of weather, meets forecasting requirements.

Over the past decade, federal agencies participated in the Joint Doppler Operational Project. These agencies are the Department of Commerce; National Weather Service (NWS); Department of Defense (DOD); AWS; Department of Transportation; Federal Aviation Administration (FAA); and the National Severe Storm Laboratory, Norman, OK. The agencies studied several objectives: determine the benefits of applying Doppler radar technology; computer enhancement; and automation technology for use in detection, analysis and forecasting of severe storms.

This study incorporated DOD requirements to ensure various factors: safety of flight, warning of hazardous weather, general weather forecasts, protection of resources on military installations and planning military operations. The new NEXRAD system is designed to carry these requirements into the 21st century.

The NEXRAD system network provides 99 percent weather radar coverage of the continental United States. It furnishes comprehensive storm surveillance information with pinpoint accuracy and permits continuous tracking and prediction of severe storms. The NEXRAD units will be linked



The value of NEXRAD weather forecasting to Army Aviation is tremendous. Aviation commanders will be able to protect Army airfields, plan for long-range operations and exercises, and quickly make decisions concerning safe flying.

to interactive principal user processors, display terminals and printers in Air Force and Army airfield weather stations. AWS forecasters and observers will use this equipment.

Overlapping coverage allows the system to continuously track storms as they move from one radar coverage unit to the next. Each radar looks at the storm system from a different perspective. The system's storm tracking and prediction capability generates information on the past, present and predicted position of each storm. Other weather products, such as severe weather probabilities, wind shears and turbulence, are formatted by using graphics on a grid display.

By using automatic meteorological computer analysis, NEXRAD detects and localizes potentially dangerous weather phenomena. The NEXRAD generates alarms that identify severe meteorological conditions, such as hail and tornadoes, and warns the forecasters of their presence. Tornado warning lead time has been increased from near zero using conventional weather radar to an average detection rate of 20 minutes before a tornado touches the ground.

When the NEXRAD connectivity is completed in mid-1995, about 130 NEXRAD units will support the FAA, NWS and AWS forecasters and observers. Then personnel can prepare and give out timely and accurate weather observations and forecasts.

Once fully commissioned, NEXRAD will enable AWS forecasters and observers to accurately predict approaching severe weather. NEXRAD will also allow enough lead time for aviation commanders to execute resource protection plans at Army airfields. Additional information received from NEXRAD-generated information will enable aviation commanders to make long-range plans. These plans will include air operations, a major part of tactical field training exercises. Critical elements of weather from NEXRAD will allow the aviation community to make quick and reliable decisions concerning safe flying. NEXRAD will also reduce weather incidents that would otherwise total millions of dollars in damage to aviation assets.

The NEXRAD system combines solid-state technology, advanced signal processing and automation features with Doppler radar techniques. This combination produces a moderately priced, highly reliable weather radar system. Quite simply, NEXRAD is the most sophisticated, accurate and timely severe-weather warning system in the world today.

CORRECTION

On page 39 of the May/June 1990 issue, the drawings for figures one and three are incorrectly transposed.

Readers are encouraged to address matters concerning air traffic control to Commander, USAAVNC, ATTN: ATZQ-ATC-MO, Fort Rucker, AL 36362-5265.

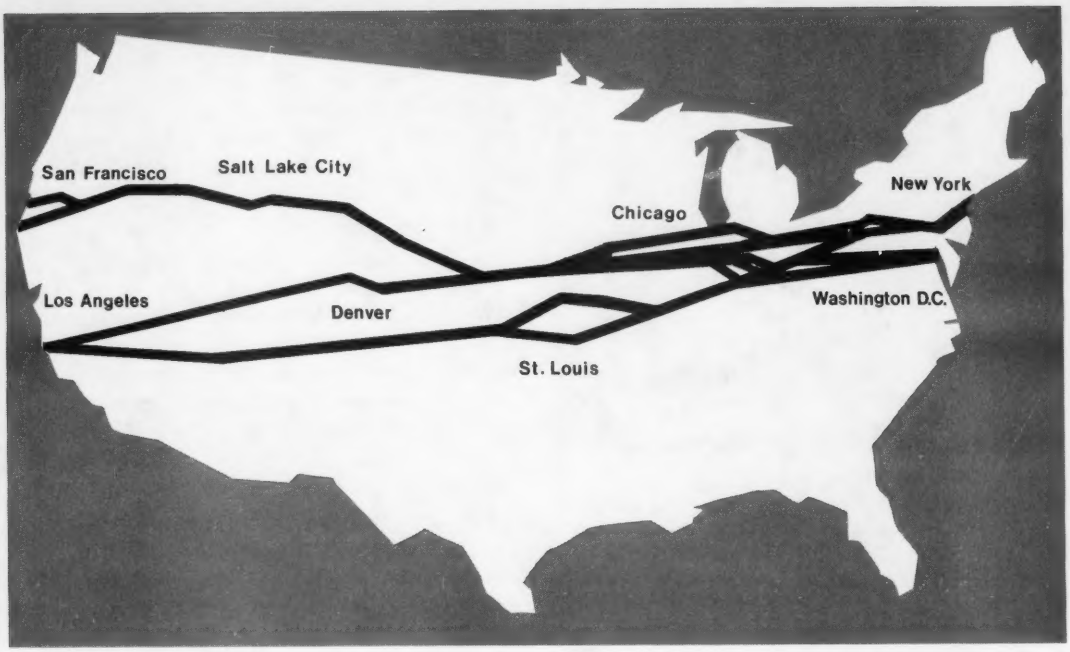


FIGURE 1: Positive control routes.

The Positive Control Area
or
(Safe Flight at Any Height)

Lieutenant Randall D. Johnson, USN
Naval Air Station
Whiting Field
Milton, FL

The function of both the positive control area (PCA) and the continental control area (CCA) has been a source of confusion for many pilots. This article examines the history and the purposes before the establishment of positive control airspace and the resulting modernization of en route air traffic control (ATC) by the air route traffic control center (ARTCC).

DEVELOPMENT and expansion of controlled airspace and the regulations that followed began with the concept: It's a good thing to be able to arrive safely at a destination without having to depart this world en route. The present day CCA and PCA were designed to provide controlled en route aircraft separation necessary to reduce the risk of midair collisions.

The growth of controlled airspace was more a reaction to events and experimentation rather than a planned expansion. Numerous fatal and near midair collisions during the 1950s were the impetus that furthered the cause of positive en route control. The two key components that helped stimulate the crusade for extending Federal control of the airspace were the growth of the aviation industry and the lack of progress in en route control.

The period after World War II saw an increase not only in numbers of aircraft but also in speed and altitude capability. Commercial, private and military aviation expanded rapidly between 1945 and 1956.[1]

On the other hand, ATC had changed little since its beginnings in 1935. Even in the early 1930s,

an official at an airport in Newark, NJ, complained he had "as many as 15 planes circling, all of them blind flying and trying to keep at different altitudes, and some of them low on gas."[2] Congestion prompted the airlines to form an airline ATC consortium with three ATC centers in Newark; Chicago, IL; and Cleveland, OH, in 1935. Flight information and position reports had to be relayed to the center by the airline dispatcher. Personnel in the center would track the aircraft's movement manually on a large tabletop map. When potential conflicts would arise, the controller would telephone the airline dispatcher and have him radio to the pilot the new altitude or course to be flown.

This was a good system for the airlines, but it left out a large segment of aviation—the military and general aviation pilots. By June of 1936 the Bureau of Air Commerce assumed responsibility for the centers, and the ARTCC had its debut.[3]

The en route air traffic system in place in the mid to late 1940s still operated on the same principles that its forerunner in 1935 did. It could not, however, be expected to separate en route instrument flight rules (IFR) safely from visual flight rules (VFR) traffic or the higher performance jet from the slower piston-driven airplane. The technology and resources weren't available. ATC was still a manual system without radar (radio detection and ranging) or direct air-to-voice communications.[4] It wasn't until the middle of 1949 that the Chicago ARTCC had the ability to talk directly to pilots. Complete ARTCC radiotelephone capability wasn't realized until 1955.[5]

What was desperately needed was the ability to separate or provide positive control for IFR/VFR and piston/jet traffic. Realization of this concept would enhance safety and expedite operations. With no (or limited) radar, segregation and control of high performance IFR traffic became the initial approach to the problem.[6]

The first step toward positive control was taken when the Civil Aeronautics Board (CAB) authorized the Civil Aeronautics Administration (CAA) to establish the CCA area on 1 December 1957. This included all airspace at and above 24,000 feet mean sea level (MSL) (except for restricted and prohibited airspace) over the 48 contiguous states as well as a high/low route structure. Airspace above 27,000 feet MSL was allocated for the high routes, while airspace below 26,000 feet MSL was reserved for the low en route system. The division was based on the view that the practical service ceiling for piston aircraft was 26,000 feet, while the en route jet traffic minimum altitude was 27,000 feet. "VFR on top" operations were allowed, and the visibility requirement of 3 miles was increased to 5 miles for VFR flight within the CCA.[7]

The weakness of the CCA lay in the fact that VFR operations were allowed, and total positive control could not be achieved. In 1958 two separate midair collisions between airliners and Air Force jets strengthened the argument for positive control.[8]

With authority from the CAB, the CAA designated "positive control route segments." A positive control route could be any segment of airspace between 17,000 and 35,000 feet MSL and no wider than 40 miles. All traffic operating within the positive control route had to be on an IFR flight plan and have an appropriate clearance.

The CAA designated certain transcontinental routes as positive control routes on 28 May 1958 (figure 1). The routes began at 17,000 feet MSL and had a ceiling of 22,000 feet MSL with a width of 10 miles. Within these route segments, "VFR on top" operations, as well as VFR climbs and descents were excluded.[9]

Positive route control was just the beginning. Many segments of

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1. Garonzik, Joseph, "War Years Brought Eyes to Air Traffic Control," *Aviation's Indispensable Partner Turns 50.*

2. Komons, Nick, "Federal Government Helped Forge New Enterprise, New Profession," *Aviation's Indispensable.*

3. Ibid.

4. Wilson, John R. M., *Turbulence Aloft,* Washington, DC: U.S. Government Printing Office, 1979.

5. Garonzik, p. 11.

6. Komons, Nick, "Historical Background to Part 91 of the Federal Aviation Regulations."

7. "Title 14—Civil Aviation," *Federal Register,* 3 October 1957.

8. Komons, p. 13.

9. "Civil Aeronautics Board [14 CFR Part 60] Draft Release 58-6," *Federal Register,* 24 April 1958 and 5 June 1958.

the aviation community were pressing for an expanded area control system. But even as late as 1959, resources were not available to the Federal Aviation Agency (FAA) to provide positive area control.[10]

Between October of 1960 and March of 1961, the FAA experimented with PCA at the Chicago and Indianapolis, IN, ARTCCs. Aircraft flying between 24,000 and 35,000 feet MSL had to be on an IFR clearance, have the capability for two-way radio communications and be transponder equipped. By 1964 radar coverage and positive area control had been extended throughout the continental United States. By 1971 the floor and ceiling of the PCA had been established at the present 18,000 feet MSL to flight level 600.[11]

Today the CCA, in which IFR, VFR and VFR flight following are allowed, begins at 14,500 feet and encompasses the PCA (figure 2). The principal advantage of the CCA lies in the fact that it effectively lowers the floor of controlled airspace to 14,500 feet in those few areas in the western United States that have uncontrolled airspace underlying it. This enables pilots to file and fly IFR flight plans that use area or point-to-point navigation.

On 18 October 1989 the Federal Aviation Administration published a notice of proposed rulemaking in the Federal Register. Two of the stated objectives of the proposed rule change are standardization and simplification of airspace management. Under the proposed rule, the PCA will be changed to "Class A" airspace. In Class A airspace, all aircraft will operate under IFR and be under positive control.

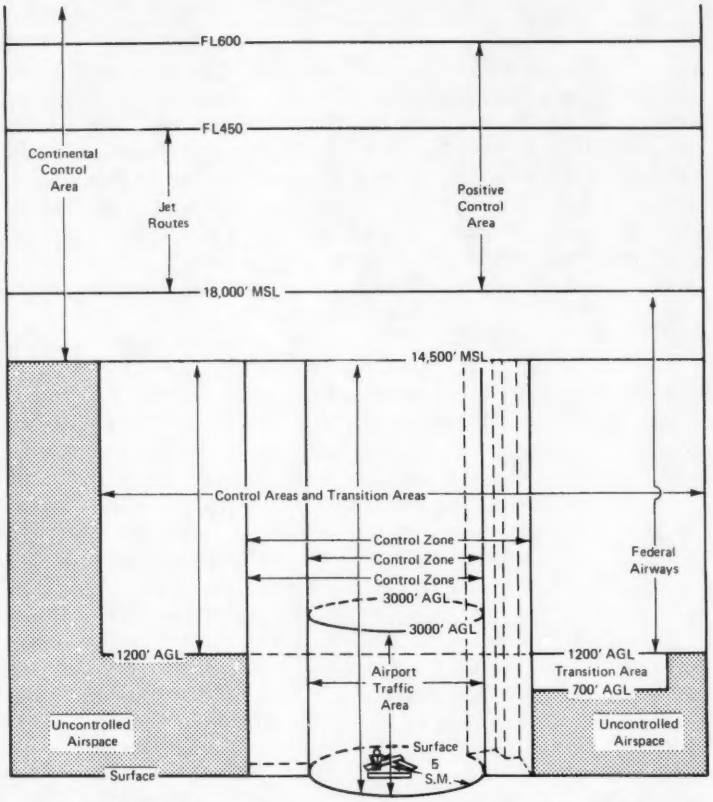


FIGURE 2: Dimensions of airspace segments (figure 3-1 from the *Airman's Information Manual*).

The CCA, along with "general controlled airspace" (colored Federal airways, very high frequency omnidirectional range Federal airways, transition areas, etc.) would be classified as or renamed "Class E" airspace. This new designation will do away effectively with the CCA since it would be classed with other controlled airspace.[12] If adopted, the changes will be placed into effect within the next 2 to 4 years.[13]

10. Komons, p. 14.

11. Ibid.

12. "Department of Transportation [14 CFR Part 1] Airspace Reclassification; Proposed Rule," *Federal Register*, 18 October 1989.

13. Pierce, A. Wayne, Interview. Washington DC, 24 October 1989.

AVIATION PERSONNEL NOTES

Promotion Updates

Colonel promotions from the fiscal year (FY) 1988 list are expected to be exhausted by 1 June 1990. Average time in service to pin on is 22/7 (year/month).

Lieutenant colonel promotions from the FY 1989 list began with the first 51 officers in May. Average time to pin on is 17/6.

Major promotions from the FY 1988 list are expected to be exhausted by September 1990. Average time to pin on is 11/11.

Captain promotions from the FY 1989 list are expected to be exhausted by September 1990. Average time to pin on is 4/7.

Officer Distribution Plan (ODP)

The ODP is the document that sets personnel goals to fill in a given specialty at each installation. ODP was created as a compromise between two situations: filling by authorizations, driven by "this is the way it should be," and actual inventory, driven by "how many we can pay this year."

About twice a year, the ODP is recomputed to reflect such changes as inventories or authorizations. The program takes the entire officer inventory and ages it 1 year. The program discounts known losses, predicted losses, predicted school populations and other factors that would reduce available officers during the coming year. The resultant population numbers are then committed against the authorization document to see how much of each specialty the Total Army Personnel Command (PERSCOM) can fill. This "ability to fill" number becomes the ODP for that specialty.

These ODPs are then further allocated to installations and major Army commands (MACOMs) to fill according to the Department of the Army Master Priority List. In the Aviation Branch, this "leveling of buckets" rarely ends up with an ODP that meets the authorizations. For example, Ft. Lewis, WA, is authorized 50 captains but only has an ODP number of 34. They will always be short 16 captains.

The ODP is used by the personnel community to determine when a given installation has a shortage the inventory can afford to fill. U.S. Army, Europe and Korea are filled at 100 percent by policy. This means the continental United States becomes the billpayer and will generally have an ODP less than its authorization. Therefore, fort "somewhere" may be short, but fort "somewhere else" has the ODP support for your skills!

Special Operations Aviation (SOA), Skill Identifier (SI) and Additional Skill Identifier (ASI)

A revision to the awarding of the SOA SI/ASI K4 was recently approved by the U.S. Army Personnel Integration Command. The new change stipulates that individuals can only use the K4 identifier in positions graded major through colonel and positions graded senior warrant through master warrant.

Qualification criteria for the identifier remain the same. Individuals must have successfully completed

1 year of duty in an SOA assignment (not including qualification training). Also, individuals must be recommended for the SI by an SOA commander in the officer's chain of command. Award of the SI/ASI K4 is made by the Deputy Chief of Staff for Personnel, 1st Special Operations Command (ASOF-PRP). For more information, consult Army Regulation (AR) 611-101, *Personnel Selection and Classification, Commissioned Officer Classification System.* Also consult AR 611-112, *Personnel Selection and Classification, Manual of Warrant Officer Military Occupational Specialties.*

Acquisition Corps Established

The Army has begun implementing a new career management program for its acquisition personnel. This is a major response to the recommendations of last year's Defense Management Review. The program will result in the creation of an Army Acquisition Corps. As part of this corps, highly trained military and civilian acquisition specialists will fill critical acquisition positions throughout the Army.

The Army places experts who have spent their careers focusing on acquisition in senior management jobs. Then the Army can expect to improve the complex and often controversial process of developing, producing and fielding new systems.

The program will also identify about 1,300 critical acquisition positions that Army Acquisition Corps members will fill—350 military positions at the lieutenant colonel and colonel levels and 1,000 civilian positions at the GM-14 level and above. These include positions in program executive offices and program management offices.

These positions also include selected staff and support positions in support commands and headquarters offices. A common office within the PERSCOM will manage both military and civilian corps members.

The Army Acquisition Corps program will essentially replace the military's materiel acquisition management (MAM) program. About 3,000 officers will be involved in the Army Acquisition Corps program. This number includes candidates in developmental assignments and certified officers occupying critical positions.

Functional Areas. The candidate officers will be drawn from functional areas (FAs) 51 (research, development and acquisition); 52 (nuclear weapons); 53 (systems automation); and 97 (contracting and industrial management). In addition, some aviators will be selected in military intelligence (FA 35 and branch 15C, aviation, tactical intelligence). All FA 51 and 97 positions and designated positions in the other functional areas are considered developmental for candidates. Candidate officers will receive skill identifier 4M. The assignment priority for these officers will shift from branch-qualifying to acquisition developmental positions.

Skill Identifiers. Officers who complete required training and assignments and are certified as members of the Army Acquisition Corps at the lieutenant colonel level will receive skill identifier 4Z. This code designates critical acquisition positions.

The more than 3,000 positions currently coded for captains, majors, lieutenant colonels and colonels with the MAM skill identifier 6T will reduce to about 350 positions for lieutenant colonels and colonels with skill identifier 4Z. The pool of officers with skill identifier 6T will realign through PERSCOM and DA selection boards in the near future.

Career Advancement. The career progression for an officer in the Army Acquisition Corps program begins in the 8th year of service when selected as a candidate receiving skill identifier 4M. The first

DEFENSE MANAGEMENT REVIEW

Key Tenets For Military Officers

- Establish dedictated corps of officers
- Experts in distinct subspecialties
  —Systems development
  —Procurement
  —Logistics
- Selection of highly promising officers early in career
- Significant operational experience
- Develop and retain acquisition skills
  keen regard for operational realties
- Attractive/equitable career paths
- Designation of corps eligible positions
- Assurance of promotion potential to highest flag grades
- Provision for advanced mgmt and tech training

step in the career track is advanced civil schooling and perhaps a training-with-industry tour. Then the officer completes the 1-week MAM course at the Army Logistics Management College at Ft. Lee, VA. The officer will then get assigned to an acquisition position in the functional area.

Following that assignment and promotion to major, the officer completes military education level-4 (MEL-4) schooling. If not selected for the Army Command and General Staff College at Ft. Leavenworth, KS, the officer should enroll in the nonresident Command and General Staff Officer Course.

An acquisition-user assignment at the field grade level follows MEL-4. This assignment allows the officer to update knowledge of current weapons, tactics and doctrine to qualify and serve as an acquisition expert for the branch.

After the field grade developmental assignment, the officer will attend the Program Management Course at the Defense Systems Management College at Ft. Belvoir, VA. Another tour in an acquisition position follows. During this tour, the officer should be promoted to lieutenant colonel and certified in the Army Acquisition Corps by receiving skill identifier 4Z.

A certified lieutenant colonel is eligible to fill lieutenant colonel 4Z critical positions and compete for selection as a lieutenant colonel product manager. The officer continues to serve in acquisition critical and developmental positions and, if selected, attends a senior service college. The officer gets certified at the colonel level and is eligible for a colonel project manager position. If not serving in a critical position as a colonel, the officer is assigned to functional area positions.

Critical Positions. Implementation of the Army Acquisition Corps program has begun. PERSCOM has designed accession, development, utilization, career management and promotion procedures for this year. Critical acquisition positions for the military have already been designated and validated through the major commands. A similar process for identifying critical civilian positions is underway.

The next step in implementing the Army Acquisition Corps program is selecting new officers and civilians for development. Other steps include developing training and education programs; writing guidance for Army selection and promotion boards; implementing personnel procedures; and publishing doctrine governing the program.

For more information, contact the Army Acquisition Corps Management Office at PERSCOM, AUTOVON 221-0217/3094 or Commercial 202-325-0217/3094.

Master Warrant Officer (MWO) Position Recoding

On 5 March 1990, Major General Rudolph Ostovich III, commanding general of the U.S. Army Aviation Center (USAAVNC) and Ft. Rucker, approved a Directorate of Aviation Proponency plan to recode MWO positions in the table(s) of organization and equipment (TOE). The proposal codes all brigade safety officer positions to MWOs.

The plan also creates two additional MWO positions in the brigade headquarters and headquarters company (HHC) for an operations or training officer and a maintenance officer. These positions are coded military occupational specialty (MOS) 153AB, 153AC and 153AG, respectively, to allow all aviator warrant officers to participate.

The aviation intermediate maintenance (AVIM) companies have one MWO 153AG position; each AVIM battalion has three MWO positions; and aerial exploitation battalions and regimental aviation squadrons retain their existing MWO positions. All MWO positions currently coded in units not listed here are redesignated for the senior warrant officer. Billpayers for the positions created in the brigade HHC will come from subordinate utility helicopter units.

Correcting base documents to reflect this change requires time. To speed up the implementation process, commanders should act on a memorandum they recently received that outlines necessary corrections to their modified TOEs. Warrant Officer Division and Officer Distribution Branch are pre-positioning MWOs rather than waiting for corrected base documentation.

Now that the TOE reflects the needs of the commander, the Aviation Proponency Office focuses on identifying MWO positions in the table(s) of distribution and allowances (TDA). This action, however, requires full participation by the MACOM. TDA commanders wishing to upgrade existing positions to MWO or creating positions where they do not exist should contact CW4 John Kissel, AUTOVON 558-4313/5706, or write Commander, USAAVNC, ATTN: ATZQ-APO-PO, Ft. Rucker, AL 36362-5036.

Army Correspondence Course Program and Resident Training Strategy

Mr. Don Funkhouser
Department of Enlisted Training
U.S. Army Aviation Center
Fort Rucker, AL

IN MAY 1989, the U.S. Army Training and Doctrine Command released a message stressing changing world events and the role the Army must face in adjusting to the new challenges. In light of new austere defense budgets, new approaches to training must be considered.

The U.S. Army Training Support Center was tasked to develop a comprehensive Army Correspondence Course Program (ACCP)/resident training integration strategy. This concept will convert resident course material to the ACCP program. These courses will become a prerequisite to attendance at institution training sites.

In May 1989, the director of the Department of Enlisted Training (DOET), Command Sergeant Major Hartwell B. Wilson, Ft. Rucker, AL, met with representatives from the U.S. Army Aviation Center Noncommissioned Officer Academy (USAACNCOA) to determine a course of action. A decision was made that BNCOC (basic noncommissioned officer course) and ANCOC (advanced noncommissioned officer course) students could be entered effectively into the program. The ANCOC Course, 68P40, Avionic Equipment Maintenance Supervisor Course, was selected as the test sample, and lessons from this course were selected in February 1990.

These lessons were converted to the ACCP format and the validation packet was handed off to USAACNCOA in April 1990. The validation was completed and handed off to the director, Directorate of Training and Doctrine (DOTD), in May 1990.

Mr. Wilder of the Institute of Professional Development, Ft. Eustis, VA, met with representatives of DOTD, USAACNCOA and DOET on 4 June 1990. It was determined at this meeting that a test program of four class iterations would be implemented starting with class 91-02, 25 March 1991, and ending with class 92-02, 13 January 1992. Results of this test will determine the Army's future action.

The new prerequisite courses are scheduled to be in the field first quarter, fiscal year 1991. Students expecting to enroll in the ANCOC military occupational specialty 68P40 course in March 1991 must complete ACCP Subcourse AVT 300, Aviation Supply, Forms and Records Management, before enrolling in class 91-02, 25 March 1991.

Questions concerning this action may be directed to the author, AUTOVON 558-5510/2169, Ft. Rucker, AL.

150,000 Accident-Free Hours

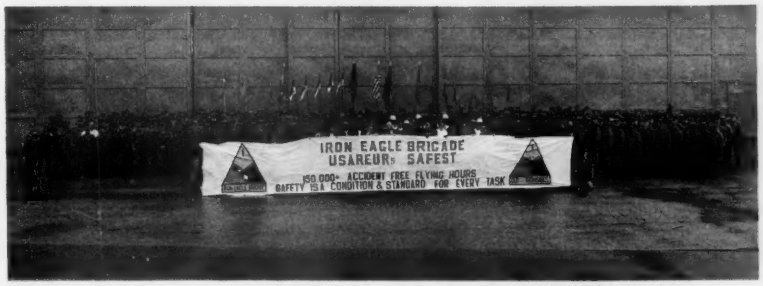
Colonel Patrick J. Bodelson
Commander, 4th Brigade, 1st Armored Division
Ansbach Army Heliport
APO New York

MEMBERS OF the 4th "Iron Eagle" Brigade, 1st Armored Division, Ansbach Army Heliport, Katterbach, West Germany, took time out from their busy daily activities on 30 October 1989 to celebrate their exemplary aviation safety record. The Iron Eagle Brigade has not had an aircraft incident involving loss of life or serious damage to an aircraft (known as a Class A mishap) since September 1982. In that time, they have logged more than 150,000 flying hours. This is a remarkable record, considering the many different types of missions in which they are involved on a daily basis. Their missions range from major tactical exercises and tactical live-fire gunnery exercises, to extensive night and night vision devices training. In addition, numerous general support flights are flown on a routine basis.

Accident-free flying is not an easy task. It takes a positive command climate, professional and skilled pilots, and competent, hard working maintenance and support personnel to make this kind of record a reality. Safety is not a task in 4th Brigade, it is a condition and a standard in all we do, both on and off duty. Hoping that missions will all come out OK is not a method of safety consciousness. Teaching and coaching soldiers about safety and making it part of everything they do is a method. You cultivate a good safety record program over time, you can't order it. You must all be tough minded about caring. Nothing you do in peacetime is worth losing even one soldier regardless of mission or circumstances.

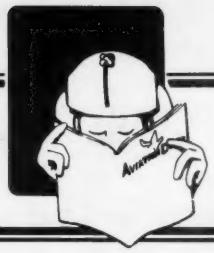
The 4th Brigade's enviable safety record goes even further than just safe flying. They also have gone more than 2 1/2 years without a fatality or serious injury on the ground. This includes soldiers and family members. Safety is a way of life for the Iron Eagle family; it is a team goal.

Their next milestone is to achieve 200,000 hours of accident-free flying hours. Today and every day is the most important day for soldiers and their families where safety is concerned. Their true goal is to live, work and train safety every day, because soldiers and their families are the Army's most valuable assets.



Soldiers, support personnel and family members of the 4th "Iron Eagle" Brigade, 1st Armored Division, Ansbach Army Heliport, West Germany, pose behind their hard earned safety banner, which attests to their outstanding aviation and ground safety record.

VIEWS FROM READERS



Editor:

Thank you, SGT Williams, for writing in the January/February 1990 *Aviation Digest* about 93Ps. It's time we 93Ps are recognized as part of aviation.

As stated in SGT Williams' letter, 93Ps will only be assigned to aviation units, as Aviation Operation Specialists. We, the 93Ps, do have a vital function not only in the departure and arrival of our assigned aircraft, but we also must be prepared to activate the preaccident plan if need be, do flight following in tactical situations with TOE [table of organization and equipment] units, have the knowledge to key our aircraft with secure equipment, as well as taking care of the administrative part of our job; i.e., flight records and crewmember orders.

We, the 93Ps, would like once and for all to be recognized as part of aviation and be awarded the Aircraft Crewman Badge.

SGT Roberta Meadors
SPC Jeffrey Sturgill
SPC Elizabeth Arcuri
Aviation Operation Specialists
Electronic Proving Ground
Aviation Detachment
Ft. Huachuca, AZ

Editor:

I am in complete agreement with CPT Scott Walton about his article on "Where Have All the Flight Surgeons Gone?" (January/February 1990 *Aviation Digest*). As a recent graduate of the Army Flight Surgeon Primary Course (AFSPC), I am painfully aware of my lack of knowledge concerning aviation operations. The AFSPC prepared me well for the medical aspects of aviation (illness and injury evaluation). However, one cannot relate to the effect of aviation duties on the pilot if one has not experienced the responsibility of a pilot. Since the AFSPC no longer includes flight training, Army flight surgeons will never have the experience necessary to be able to relate to the pressures of aviation.

CPT Walton made the excellent point that the current AFSPC graduate has a passenger's perspective of flying and invites faulty aeromedical decisionmaking. Part of a flight surgeon's responsibility is to perform in-flight evaluations on pilots who have medical problems that may affect their flying performance. Without any aviation training it is impossible for AFSPC graduates to detect subtle or not so subtle performance problems in aviators. The flight surgeon may incorrectly judge the pilot's performance requiring needless lab tests or, worse, permanent disqualification from aviation duties.

CPT Walton also pointed out that some flight surgeons are now conscripted, and I believe that this will cause trouble in the future if the trend continues.

The etiology for the current problems is the budget cutbacks that are here to stay. However, the elimination of flight training from the AFSPC is rapidly having adverse effects and budget cuts should be sought elsewhere in areas having less impact on aviation safety. I again express my support to the instructors of the AFSPC and hope enough concern is raised to reinstitute flight training in the AFSPC.

CPT Mark Lewis, M.D.
Flight Surgeon
Ft. Huachuca, AZ

Editor:

The 39th Department of Defense (DOD) Conference on Nondestructive Testing (NDT) is scheduled 5 through 9 November 1990 at the Red Lion Inn, Modesto, CA. The conference host is Sharpe Army Depot, Lathrop, CA.

The annual conference is restricted to U.S. Government military and civilian personnel involved in research, development and application of NDT methods. The conference serves as a vehicle for exchange of information for DOD Government activities.

Recent changes to the DOD conference bylaws now allow nongovermental organizations performing NDTI/NDE projects (Government funded) to present technical or problem papers before the General Assembly. Only those Government projects, totally Government funded and applicable to defense efforts,

approved by the conference steering group, will be allowed.

For additional information, please contact me at Commercial 926-388-2174 or AUTOVON 839-2174.

Mr. Augustine Terminel Jr.
NDT Coordinator
Maintenance Quality Assurance Division
Directorate of Product Assurance
Sacramento Army Depot, CA

Editor:

The 32d Israel Annual Conference on Aviation and Astronautics will be held in Israel on 20 and 21 February 1991. The conference will provide a forum for the presentation and discussion of the latest advances in the following subject areas:

- Aerodynamics and aerodynamic testing.
- Materials, aeronautical structures and structural testing.
- Structure dynamics and aeroelasticity.
- Aeronautical design, CAD/CAM, manufacturing and maintenance.
- Propulsion and combustion.
- Flight control, guidance and navigation, avionics.
- Flight mechanics and ballistics.
- Flight operation and systems.
- Space systems and astrodynamics.

Papers on recent advances in basic research and technology applications in the above mentioned areas, as well as other aerospace related fields, are invited. Abstracts of 1,000 to 1,500 words should reach the chairman of the Program Committee by 18 September 1990.

For more information, please contact Dr. Alon Dumanis, Chairman, Program Committee, 32d Israel Annual Conference on Aviation and Astronautics, Faculty of Engineering, Tel Aviv University, Ramat Aviv 69978, Israel; FAX: 00972-3-5414540 or TEL: 007972-3-5414541.

M. Wertheimer-Shimoni
Conference Secretary

Editor:

Of potential interest to your readers is a digital version of the CHart Updating Manual (CHUM) currently being developed by the Defense Mapping Agency (DMA). This electronic CHUM (ECHUM) will make available to users all the information in the CHUM and CHUM supplements in an electronic/digital form. Like the CHUM, the ECHUM is planned to be released semiannually (March and September) with cumulative monthly supplements during the 5 months between editions.

To date, DMA has released one 9-track magnetic tape containing digital CHUM files. However, DMA's ECHUM tasking plan calls for a production prototype to be generated and distributed in mid-September 1990. This prototype also will be on 9-track tape and will contain five textual files, two index files and one graphics file. It will not be accompanied by application software, although it will be formatted to operate within a dBASE environment for data query. The final ECHUM product will be available on CD-ROM [compact disk-read only memory] and is planned to be accompanied with a complete suite of application software. The time schedule for full ECHUM production has not yet been established.

The Digital Concepts and Analysis Center (DCAC) of the U.S. Army Engineer Topographic Laboratories serves as the primary Army point of contact for all military applications of digital terrain data (DTD). It is our responsibility to coordinate Army evaluations of emerging DTD products. DMA has requested that DCAC provide feedback from Army users to help direct the development of the ECHUM. To ensure that user requirements and concerns are addressed, DCAC request that interested Army components contact us directly. Call the point of contact at DCAC on AUTOVON 345-2764 or Commercial 202-355-2764 or write:

Mr. John Bradley
U.S. Army Engineer Topographic Labs
ATTN: CEETL-CA-S
Ft. Belvoir, VA 22060-5546

Editor:

Request the following notice be run in the *Aviation Digest*:

Attention UH-60 Black Hawk pilots! The U.S. Army Aeromedical Research Laboratory is in need of aviator subjects to participate in ongoing research. Currently, we need aviators between the ages of 21 and 40 with 20/20 vision, on flight status with a current flight physical. If 10 UH-60 simulator flight hours in 2 weeks would interest you, contact the USAARL aviator representative at AUTOVON 558-6864.

CPT Michael H. Hulsey
Adjutant
U.S. Army Aeromedical Research Laboratory
Ft. Rucker, AL

Readers can obtain copies of material printed in any issue by writing to: Editor, U.S. Army Aviation Digest, P.O. Box 699, Fort Rucker, AL 36362-5042.

REFORGER 90

READINESS

Captain Michael J. Karr
Headquarters, 2d Squadron, 6th Cavalry
11th Aviation Brigade
APO New York

Centurion Shield was the code name for Return of Forces to Germany (REFORGER) 90. REFORGER, the joint combined arms field training exercise, focused on the rapid deployment and interoperability of the types of forces that might be used in the defense of Europe.

One of the VII Corps' newest team players, the 2d Squadron, 6th Cavalry, 11th Aviation Brigade, was there with its AH-64 Apache helicopters. It provided day and night maximum destruction operations for the VII Corps and its subordinate commands.

This year's most noticeable commands included the 10th Mountain (Light Infantry) Division and the 2d Armored Division, from the continental United States, and the 12th Panzer from the Federal Republic of Germany. This multinational force defended the Southland against the V Corps' Northern forces. The introduction of the Apache on the modern battlefield tested commanders and the corps planning cell's ability to successfully execute AirLand Battle doctrine. This doctrine, designed to maximize force effectiveness by synchronizing all available combat means, including those of other services, allowed the VII Corps to influence the action on the battlefield throughout the entire exercise.

The AH-64 Apache is as quiet and as deadly as its namesake. Armed with HELLFIRE missiles, rockets and 30 mm cannon primed for the maximum destruction of enemy forces, the 2d Squadron, 6th Cavalry—the "Fighting Sixth"—flew throughout the battlefield's low, winding valleys in search of enemy targets.

Through their pilot's night vision sensors and the target acquisition and designation system, the pilot and copilot scanned the valley floors while shadowing their OH-58D and OH-58C Kiowas.

On contact with the enemy, the squadron deploys, then services targets through either remote or autonomous firing techniques. Using these techniques, the squadron was able to send HELLFIRE missiles into unsuspecting tank formations up to 7 kilometers (km) away. This enabled Lieutenant Colonel Terry W. Branham's Fighting Sixth to destroy battalion-sized armor formations inside 10 minutes, using three attack troops in a synchronized maximum destruction operation. This rendered brigade-sized elements combat ineffective and caused many commanders to rethink their tactics.

This sounds good; however, there were a few problems associated with our operations. This year's shift from numerous track vehicles to high mobility, multipurpose wheeled vehicles (HMMWVs) with rubber balls on antennas to simulate tanks provided a quicker pace in the action

and less signature. The reason for using HMMWVs instead of tanks was to minimize the maneuver damage. Through computer enhancement, corps and higher planning staffs were exercised in conditions as stressful and close to combat conditions as possible.

The second problem associated with using a single HMMWV to represent a company of tanks is that it makes it difficult to produce an accurate intelligence preparation of the battlefield. For example, how can you template that tank battalion as a HMMWV platoon? The need for accurate intelligence preparation of the battlefield cannot be overshadowed. The lack of this timely, continuous information forced the 11th Aviation Brigade, led by Colonel Johnnie B. Hitt, to vacillate the time schedules of his attack units, the 2d Squadron, 6th Cavalry, and the 4th Battalion, 229th Attack Regiment.

The absence of decision points, 12 to 24 hours deep from the forward edge of the battle area, produced uncoordinated attack proposals from the corps deep planning cell. This created a ripple effect that reduced the planning time the brigade needed, which further reduced the squadron's planning time and focus. Instead of planning for the systematic destruction of one target at night, they had to plan multiple routes and engagement areas anywhere from 20 to 200 km apart. What is worse was the failure to use the Apache's greatest asset, the ability to fight at night. This greatly increases the survivability of the aircraft and its crew and provides the corps 24-hour attack capability. Last, the crews lost the valuable night training provided by an exercise of this magnitude. Night training was hindered greatly by unpredictable January weather and peacetime flight requirements. The squadron did, however, accomplish their REFORGER training objectives.

Next year's success will depend on the corps planning cell's ability to take lessons learned this year and arrange battlefield activities in time, using continuous intelligence preparation on the battlefield decision points, to produce the maximum relative combat power at the decision point. We must continue to practice and refine the use of our Apache doctrine so that we do not reinvent the wheel every time we go to the field for training.

One reason the U.S. land forces and air forces turned to the AirLand Battle doctrine is that it maximizes technology to overcome numerically superior enemy forces. Major exercises such as REFORGER allow us to practice the skills needed for rapid transition to war. Successful accomplishment of our training objectives gives individuals pride in their own professionalism and the confidence in their leadership. The training in REFORGER this year was deliberately tough and challenging, the nearest thing to combat that planners and Germany's geography could provide.

The 2d Squadron, 6th Cavalry, 11th Aviation Brigade, with its AH-64 Apaches, is right at home in Europe on today's high-technology battlefield. The Fighting Sixth is working hard, taking the extra step that ensures readiness of people and weapons systems. After all, readiness is what effective defense is all about.

Use of the AH-64 on the modern battlefield will result in future readiness of our combined arms team.

REFORGER 90

RESERVES

Major Guy A. Rogers II
HHC 33d Aviation Group
U.S. Army Reserve
Fort Rucker, AL

The phone rang. I rolled over to check the clock. It was 0430. Not another wrong number. The voice on the other end said something about a herd grazing. "A herd grazing?" I asked, "Where, in my back yard?" Then it dawned on me that they had called an alert.

I dressed and drove to the Reserve Center. Two other "full-timers" arrived there before me.

"What's up?" I asked.

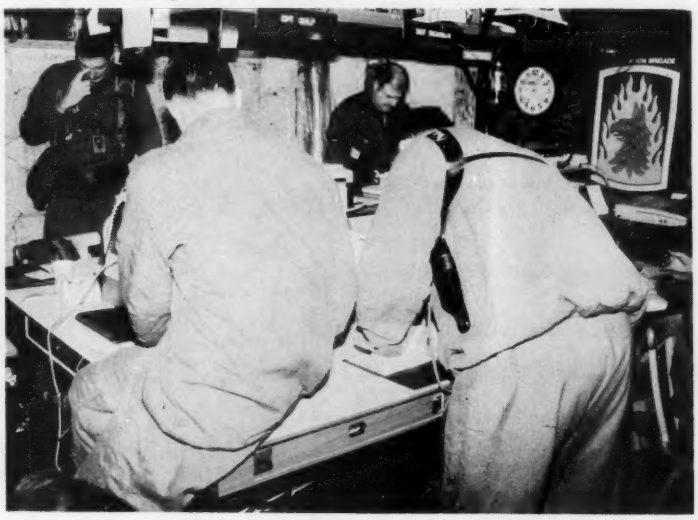
"Drilling reservists are being called to notify them of the alert," they responded.

Three days later, per instructions—this was only a practice alert—the troops started rolling in. We used the next 2 days to prepare in-processing paperwork and equipment showdown. Saturday rolled around, and we loaded up our equipment and headed for the airport. Now you are asking, "Hey, I thought he said this was a practice alert?" Well it was, but we were on our way to Return of Forces to Germany (REFORGER) 90.

This year REFORGER was played in the southern part of Germany. The "box" (the area set aside for the ground and air maneuver) ran between the German borders south of Nurnburg. Since this was a winter REFORGER, the usual winter problems existed—everything from mud to ice clouds.

Our unit, an aviation group, was formed in 1988. This was the first ODT (on duty training) for the group staff. Our headquarters

S2 section of the brigade tactical operations center.



is designed to take its two attack helicopter battalions anywhere in the world and provide command and control for them and any other attached units.

The aviation brigade to which the group is "CAPSTONED"—a term used to designate the command relationship between Reserve Components and their wartime higher headquarters—has 60 percent of its wartime fighting strength (manpower and aircraft) assigned to the Reserve Components. Not until the reserves are called up and deployed will the corps have its needed aviation assets.

The group staff had the good fortune of working with its corps aviation brigade. Primary staff members from the group were placed along side their staff counterparts at the aviation brigade. Representatives from all the group staff section participated from the corps TOC (tactical operations center) down to subordinate AH-64 Apache battalions. As peace continues to flourish, the Reserve Components will play an even bigger part in the national defense as the Active Components start to size down.

The brigade supported its corps in an offensive posture the first week and took every opportunity to employ the AH-64 assets in deep operations. A representative from the brigade was placed in the corps deep planning cell. The cell consisted of members from the artillery, U.S. Air Force, electronic warfare (EW), Army Aviation and target analysis communities. The cell's sole reason for existence was to plan deep strike targets for the corps commander. It juggled Lance missiles, battlefield air interdiction, EW, and AH-64s to find the right weapon suited for the right target. The first week ended with our side advancing quite well against the opposing defensive corps.

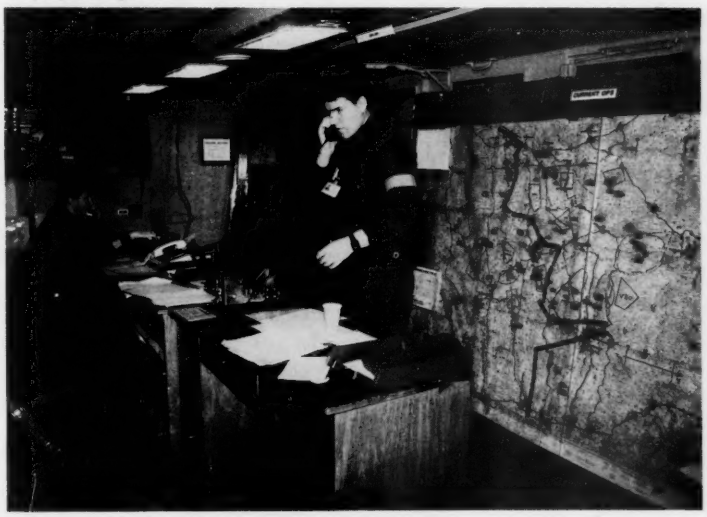
We started the second week in a defensive posture, but that did not last long. Too many opportunities presented themselves for a change to the offensive; therefore, the corps commander seized the chance to make a change. The weather had improved, and the AH-64s were not being used for the cross-forward line of own troops (FLOT) deep strike missions.

A "fat cow" (a CH-47D Chinook rigged with internal fuel bladders and two refueling nozzles) was used with great success in accompanying the cross-FLOT missions. This concept assured that enough fuel was on board deep strike aircraft that were returning.

The week continued to bring better weather and more use of Army aircraft. The days lengthened in the corps deep planning cell as plans were continuously being made for cross-FLOT missions. REFORGER 90 ended with the least amount of maneuver damage in the history of the exercise.

This was the group's first ODT and many went to the exercise with wide-open eyes. The exercise was a great learning experience for the many players who had never been to Germany before. We hope our CAPSTONED brigade headquarters benefitted as much from the exercise as we, their visiting Reserve subordinate units, did. All of us are looking forward to REFORGER 91.

Corps planning cell.



REFORGER 90

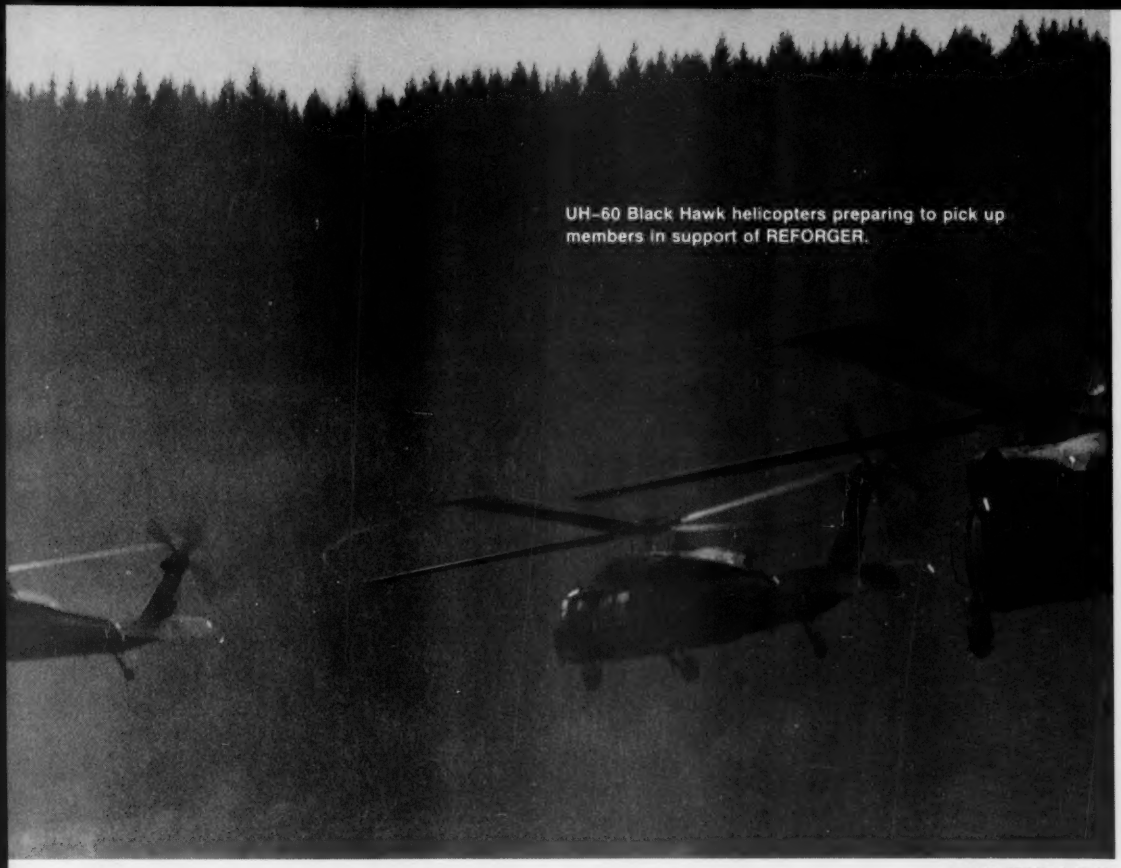
SUPPORT

Specialist Sean Martin
Headquarters V Corps
65th Public Affairs Detachment
Massachusetts Army National Guard

The U.S. Army is like a machine. It needs to be refueled to keep running. Members of the various German-based support companies that form the 26th Supply and Service Company (Co), called Task Force Sasser, drove that point home. Refueling played a significant role during Return of Forces to Germany (REFORGER) 90, Centurian Shield.

Task Force Sasser delivered everything the Army needed to keep marching. Fuel, equipment, replacement parts and food were just some of the necessities. Exactly what was needed, and where, was determined at a field rations breakpoint (FRBP). Basically a warehouse in the field, an FRBP can be moved on a moment's notice.

"That's the most important aspect of the FRBP," said Second Lieutenant (2LT) Anja Wright, an FRBP officer in charge. "REFORGER 90 is very realistic training for my soldiers. We are doing everything we would do in wartime. The only exception is that we're not moving the FRBP as much as we would in war. But



UH-60 Black Hawk helicopters preparing to pick up members in support of REFORGER.

photo by SPC Edwin Larkin

that's being done to keep maneuver damage to a minimum," said 2LT Wright.

Specialist (SPC) Lori Cyrus, a subsistence food supply specialist, worked the FRBP from the administrative end.

"We keep a running total of all supplies we receive and everything we issue. We also must keep a strict record of everything that's damaged during REFORGER," she said.

Challenges were presented by the large-scale winter exercise, according to SPC Cyrus. "The cold was a big hurdle to jump. We deal with frozen foods like T-rations, but it's the hot stuff that is difficult. We really have to keep on our toes to provide hot meals. We've been able to do that, and it's something I'm very proud of," said SPC Cyrus.

Fuel also was a priority.

"I man a tank pump unit from 0800 to 1800 hours," said SPC Emmanuel Puplampau, a petroleum supply specialist. "We've been slingloading a lot of the fuel on CH-47 Chinook helicopters and it was delivered by the 12th Aviation (Avn) Brigade (Bde). It's also taken to the field by truck on shorter runs, and everything's gone really well," he said.

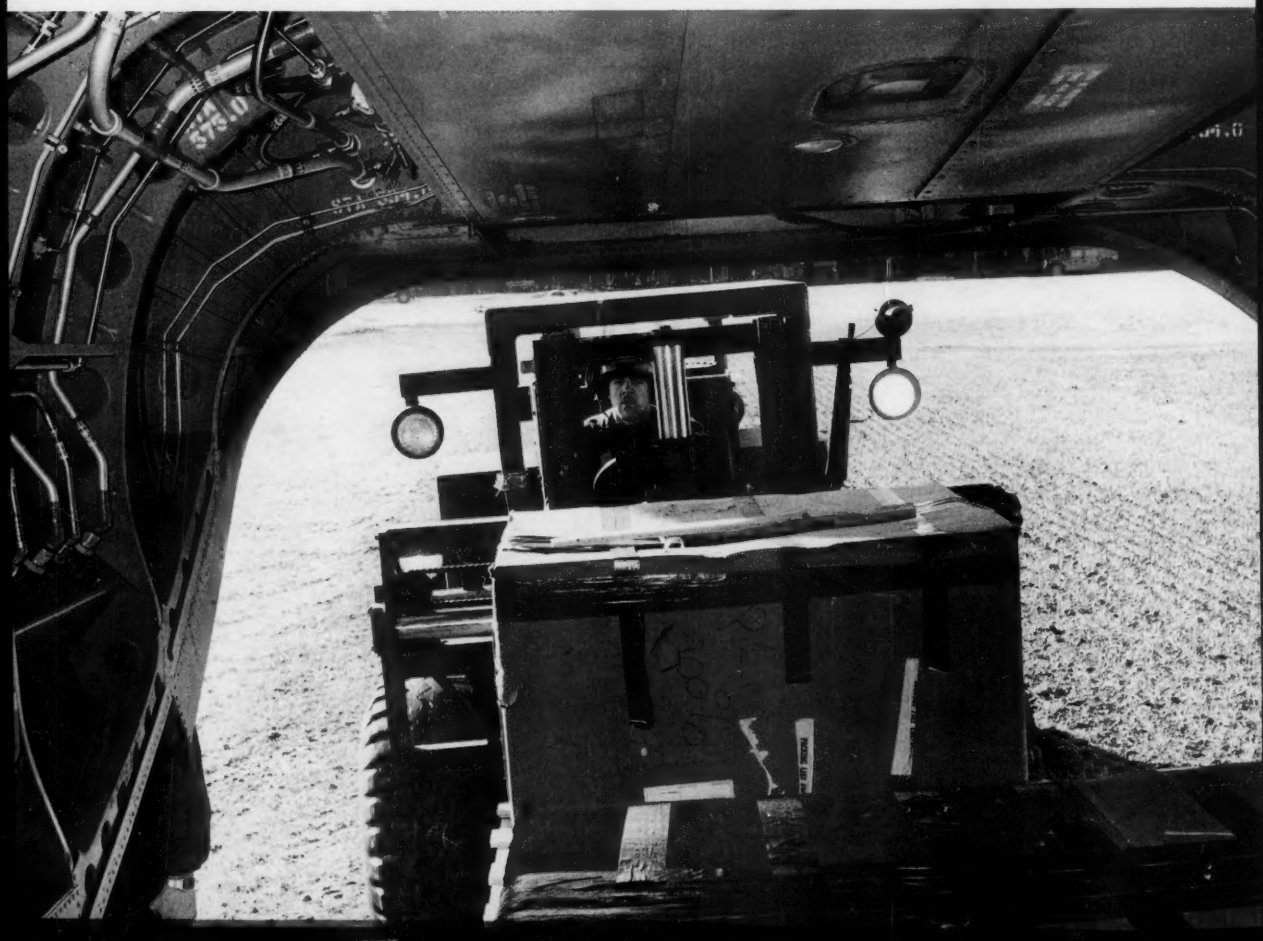
One afternoon provided a chance for the 12th Avn Bde to airdrop a forklift and food supplies to the 41st Field Artillery (FA) Bde, 477th Service Battery, near Scheuring, West Germany.

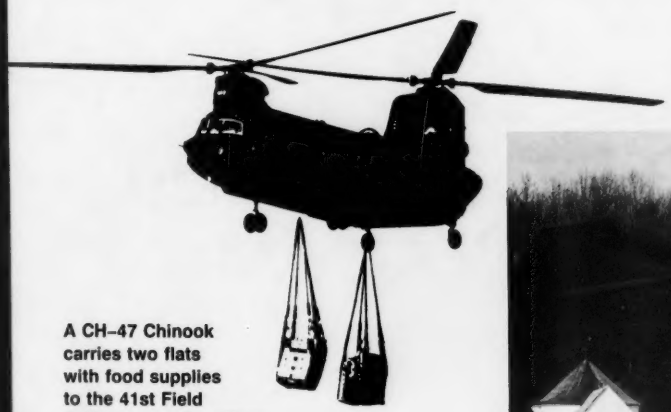
During the drop, the Chinook hovered 6 feet from the ground until the cargo hanging from the slings rested gently on the ground. It released automatically, so the crew didn't have to leave the helicopter. The only time they needed to get out was during a pickup.

"We're capable of performing missions 24 hours a day with the Chinook," said Chief Warrant Officer (CW3) Fred M. Riley, pilot in command for B Co, Task Force Warrior Battalion, 12th Avn Bde. "In the case of resupplying the 41st FA, we had to drop the supplies and move. Their soldiers will pick it up using the forklift, but they must do so with fire cover because the area

Rough terrain forklift driver, PFC Jay VanEtta, unloads pallets of food supplies from a CH–47 Chinook helicopter. The food was bound for troops in the field near Scheuring, West Germany.

photos by SSG Randy Piland





A CH–47 Chinook carries two flats with food supplies to the 41st Field Artillery near the village of Scheuring, south of Augsburg.

A CH–47 Chinook (right) releases a sling loaded, rough terrain forklift in a field where normally only a small chapel sits in solitude.

photos by SSG Randy Piland

can come under enemy fire at any moment," said CW3 Riley.

The supplies that reached the 41st FA took a week to get there, but it had nothing to do with the aviators or the Chinook. Weather was the mission crippler. Weather is a factor that affects all soldiers, but perhaps none more than pilots.

"This area had a low ceiling and too much fog for the first week of REFORGER. We had to wait it out," said First Lieutenant (1LT) Stephen C. Ethen, copilot and B Co platoon leader. "For the past week, food and supplies had to be taken out of here by truck. But now that the weather has cleared, we turn a 6-hour trip into a 3-hour one," he said.

But did foggy conditions cut into the quality of training for the 12th Avn Bde?

"I don't think so," replied 1LT Ethen. "We were prepared for this kind of weather. Plus, we've been flying supplies to other units, and the missions have all been very realistic. This is exactly what we would be dealing with if war broke out."

Similar comments came from other members of the flight crew. Sergeant (SGT) Daniel R. Henry, flight engineer, was in contact with the pilots. He kept them updated on any problems, potential or actual, that arose. He also performed daily preventive maintenance checks.

"What I've been doing is as close to the real thing as it gets," said SGT Henry. "When the weather holds, we drop the supplies. But even if we don't fly, the maintenance must be done. I consider REFORGER an exercise worth the effort," he said.

Get in...drop it...get out. That was the combat mission of the 12th Avn Bde. During REFORGER 90, Centurian Shield kept those flyers moving.

Remotely Piloted Vehicles: One Marine's Perspective

Captain Franklin D. McKinney Jr.
Marine Light/Attack Helicopter Squardron 167 (HML/A-167)
Marine Aircraft Group 26
2d Marine Aircraft Wing
Marine Corps Air Station New River
Jacksonville, NC

WHY IS A MARINE captain writing an article for an Army publication, and about remotely piloted vehicles (RPVs) at that? I am writing this article to provide information about a little-known subject and to give some food for thought. To write an indepth study on the capabilities, limitations and methods of employment of RPV is beyond the scope of this article. With budget support for the Army's Aquila program cut and the recent success of the U.S. Navy employment of the Pioneer RPV system in the Persian Gulf, the Army is taking a closer look at the Pioneer Short-Range Tactical RPV System. This article will cover a brief history of RPVs in the Marine Corps, organization, system description, employment and food for thought.

History

Although RPVs were used in Vietnam, the current family of tactical RPVs began their history with the Mideast War of 1973. Following heavy losses of manned aircraft to Soviet-type air defense systems in that war, the Israeli Defense Force (IDF) began a priority project to develop an unmanned platform for aerial reconnaissance. The success of the project was clearly demonstrated during the 1982 invasion of Lebanon. (See also "The Israeli Air Forces and the 1982 Lebanon War 'Operation Peace for Galilee'" article beginning on page 60.) As a significant asset of the IDF's intelligence network, the real-time video RPVs provided enabled Israeli commanders to stay consistently one step ahead of their adversaries.

The current RPV program in the Department of the Navy began its history with the Multi-National Force in Lebanon. Because of the loss of manned aircraft, the untimeliness of aerial photo reconnaissance and the inaccuracy of unobserved naval gunfire on targets deep in the Shouf Mountains, Mr. John F. Lehman Jr., then Secretary of the Navy, directed that U.S. forces be provided RPV capability.

Detachment A, Target Acquisition Battery, 10th Marine Regiment, Camp Lejeune, NC, was formed in January 1984, de-

ployed to the Middle East, and trained on an operational RPV system. Returning to Camp Lejeune, the unit continues to evolve as an operational and testbed unit for RPV development. Detachment A was redesignated 1st RPV Platoon in September 1984, and subsequently renamed 2d RPV Company in October 1986. The 2d RPV Company is located with the Surveillance, Reconnaissance Intelligence Group, 2d Force Service Support Group at Camp Lejeune.

From January 1984 until December 1986, the Marines operated the Israeli-made Mastiff Mk III RPV system. During the spring of 1987, the 2d RPV Company received its first Pioneer RPV system. The Pioneer RPV system is another Israeli system, purchased through an American contractor. At that time, the Pioneer system was not an operational system with the IDF. Initially, the Marines experienced severe electronic, mechanical and spare parts problems. There are still many things about this system that do not work.

Organization and System Description

The Marine RPV companies are organized into a company headquarters, a maintenance platoon and flight platoons. The number of flight platoons is undetermined at this time, but each flight platoon will operate one Pioneer system. Each system consists of a ground control station (GCS), tracking control unit (TCU), portable control station (PCS), air vehicles (RPVs), remote receiving stations (RRSs) and associated ground support vehicles and equipment.

The GCS is the brains of the system and is where the flight crew performs its mission under the supervision of the mission commander. There are two stations: the pilot bay and the payload bay. The pilot bay controls the flight of the RPV while the payload bay controls the onboard video camera.

The TCU is the remotable antenna system for the GCS and houses all tracking and communications equipment for controlling the RPV. Both the GCS and TCU are housed in S-250 shelters on commercial utility and cargo vehicles or one S-280 shelter on a 5-ton truck.

The PCS and its antenna perform the functions of the pilot's bay from the GCS. It is used primarily for preflighting and launching or recovering the RPV when the GCS/TCU are not located at the launch or recovery site.

The air vehicles have an approximate wingspan of 17 feet and are 14 feet long. Maximum weight for takeoff is about 429 pounds. The flight endurance varies from 4 hours with the infrared (IR) camera to about 5½ hours with the daytime black-and-white camera.

The RRS is the most important piece of equipment that the RPV company uses to support other units. It is a black-and-white monitor that mounts in a vehicle radio mount. This is a receiver only and allows the supported unit commander to see the battlefield or target area on a real-time

Remotely Piloted Vehicles, *continued*

basis and to react accordingly.

The following are some of the advantages of the RPV system:

- A real-time data link capability that provides video for acquisition, storage, interpretation and dissemination of combat information out to 100 nautical miles (nm).
- A low probability of detection because of the reduced visual and IR signature.
- Rapid and accurate targeting for adjustment of supporting arms.
- A day and night system capability.
- A preprogramed mode of operation that reduces radio frequency emissions.
- Reduced exposure of manned aircraft to lethal weapons systems.
- No requirement to collocate GCS at the launch or recovery site.

Several disadvantages that must be considered when employing RPVs include:

- Environmental considerations.
- The inability to fly in rain or icing conditions.
- Video quality is reduced by certain meteorological conditions and battlefield obscurants.
- Wind limitations for launch and recovery.
- A line-of-sight transmission limitation exists between the TCU and RPV, and the RPV and RRS.
- While more than one air vehicle may be airborne at any given time, only one can be actively controlled at a time. Also video down link can only be processed from one RPV at a time.
- Transportation requirements include handling of nonmilitary special equipment (i.e., the system is fragile).
- System location data accuracy is based on a survey requirement for the TCU.
- Special fuel considerations require 100 octane low-lead aviation gasoline.
- For now, a cadre of civilian technical representatives will accompany the system.

Some vulnerabilities of the system include the following:

- The video signal from the RPV is nonencrypted and can be interrupted or exploited by any threat force with compatible equipment.
- Once detected, it can be destroyed by any weapon used for antiaircraft artillery purposes.
- Normal RPV operations require that the TCU be an emitter, which then makes it susceptible to enemy electronic warfare actions.

Employment

Since the Pioneer system has a 100-nm radius of operation, the launch or recovery site normally is located in the rear area outside the range of threat artillery. The RPV company normally is attached to the command element of the Marine Air Ground Task Force (MAGTF). It is used in general support of the MAGTF. But the RPV company also may be put in direct support of any subordinate element of the MAGTF for specific missions or periods of time. The GCS/TCU are normally located forward near the supported unit combat operations center or fire support coordination center. Units submit requests for RPV support to the controlling headquarters identifying the desired targets, locations, times and coordinating instructions in as much detail as possible. The RPV operations officer or liaison officer then coordinates the mission with the air officer, intelligence section, operations section and fire support coordinator. The G3 or S3 resolves any conflicts based on the commander's guidance. Because of the flight endurance of the RPV, it is ideally suited for immediate mission tasking. After receiving an immediate tasking, the RPV mission commander coordinates the change with the airspace control agency before directing the crew to divert from the already approved flight profile. The Pioneer RPV is not well suited to strip alert (standby) missions because of the tendency for the avionics to overheat. Time required to preflight the GCS/TCU and RPV, crank and launch the RPV is about 2 to 3 hours depending on the problems discovered during preflight tests. Upon completion of the mission, the recorded video tapes are then forwarded to higher headquarters for further detailed exploitation.

The RPV integrates easily into the existing command, control and communications system. The MAGTF commander establishes mission priorities and whether RPVs are placed in general support or direct support units. The mission commander, in coordination with the airspace control agency, always retains flight control of the RPV. To the greatest

extent possible, the RPV company uses existing communication nets to connect the RPV company with supported units and airspace control agencies. The RPV company command net is the only new radio net established.

During a mission, the mission commander is in constant contact with the supported unit or higher headquarters. The mission commander: provides intelligence or adjustment of supporting arms; provides the RPV launch or recovery site; coordinates flight handovers from the PCS to GCS and back; and serves as the airspace control agency for route clearance and flight following. Usually, there are no conflicts with rotary-wing aircraft, except during the launch or recovery phase, since the mission altitude is normally 3,000 to 4,000 feet above ground level (AGL).

Food for Thought

While performing a reconnaissance mission, the mission commander normally takes direction from the supported unit's intelligence officer. If during the mission the RPV finds a target of opportunity that the MAGTF commander wants supporting arms to engage, the mission commander contacts the supporting artillery unit. The payload operator of the artillery unit conducts the adjust-fire mission. It is essential that the payload operator be cross-trained as photo interpreter and artillery forward observer.

In the past, different types of overlays or control measures have been used to depict the RPV area of operation. The most widely used and understood methods are to use the aviation check points and air corridors that the aviation combat element (ACE) of the MAGTF uses. Another method is to establish RPV patrol routes and loiter areas oriented to areas of interest. Still another method is to establish restricted operating zones (ROZ) and have the RPV fly direct from ROZ to ROZ. I found that using the ACE overlay was the most flexible and widely understood method.

The Pioneer RPV system is a sophisticated computer system, and like any computer system changes in temperature and weather affect the system. It may be working fine when power is secured for the day, but when power is applied for the missions the next day, several fault conditions may exist. The troubleshooting procedures may take anywhere from 10 minutes to 2 hours. Because of this, launch times are not definite.

The operational radius of the Pioneer system is 100 nm. However, you must maintain electronic line of sight between the TCU and the RPV. The further the distance, the greater the altitude the RPV must fly, thus the lower the camera resolution. The black-and-white daytime camera with its 10-to-1 zoom offers excellent resolution to identify vehicles and count individual people from about 4,000 feet AGL. Moving targets or objects that contrast with their surroundings are easier to locate and identify than small stationary or well-camouflaged targets. The RPV is not an area search platform. It works best when ground reconnaissance elements or remote sensors are cued to a particular area.

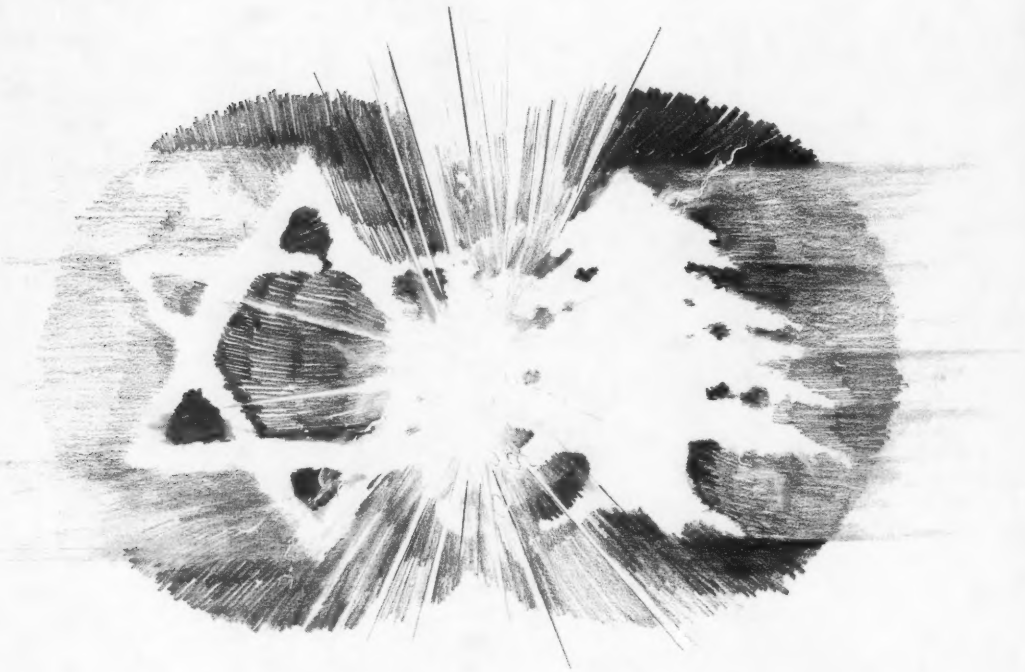
The IR day and night camera offers four different focal lengths that roughly approximate the 10-to-1 zoom of the daytime camera. This camera allows operation at night and through thin haze or light fog. It also makes the task of locating camouflaged targets that produce a heat signature easier. On a recent exercise, the GCS crew could count the individual people debarking from a landing craft. The time was predawn (read dark), RPV altitude was 5,000 feet and slant range was about 3½ kilometers.

The Pioneer system has a large foot print for shipboard or air movement. Essential equipment can be carried in one C-5 Galaxy aircraft, but some spare and motor transport items may not fit.

As mentioned before, the Pioneer is a short-range, tactical RPV system that can operate out to 100 nm. The Navy is also developing a midrange RPV with a range of 350 to 400 nm. It probably will be an air-launched, high-subsonic speed jet RPV. Another capability being explored is a high-altitude, long-endurance RPV built on the technology of the *Voyager* that flew around the world without refueling. It is obvious that RPVs are here to stay and the skies will be getting more and more crowded. The time is upon us to learn how to safely integrate these systems into our airspace management system.

I hope this article opened your eyes somewhat as to the use of RPVs as a force multiplier. I did not intend to cover all aspects in detail, but to give an overview and provide some food for thought. The Marine Corps Operational Handbook 2-2, *Remotely Piloted Vehicles Employment*, and Navy Surface Force TACMEMO XZ 0010-1-86, can provide you with a more indepth description of employment procedures and tactics.

"Operation Peace for Galilee"



The Israeli Air Force and the 1982 Lebanon War

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The importance of the Israeli Air Force (IAF) in the defense of Israel was clearly established during Operation Peace for Galilee in June 1982. The strategic objectives of the Lebanon War presented Israel with several tactical challenges. By employing the latest technology and well-rehearsed tactics, in fixed- and rotary-wing aircraft, the Israeli Defense Force (IDF) was able to meet all major objectives with minimal losses in personnel and equipment, and many valuable lessons were learned.

A SERIES OF political and military events led up to Operation Peace for Galilee. The first of these was an alleged assassination attempt the Palestine Liberation Organization (PLO) made on an Israeli ambassador in May 1982. Israel sought revenge through retaliatory air strikes on PLO positions in southern Lebanon. This action prompted a renewed artillery shelling by the PLO that was directed at Israeli villages in Galilee and the buildup of Syrian SA-6 sites in the Beqa'a Valley. In the face of rising tension and Syrian military buildup, on Sunday, 6 June 1982 at 1100 hours, the Israeli Army launched a surprise attack into Lebanon. The overall objectives of the operation were as follows:[1]

- Establish a 25-mile buffer zone to protect against PLO attacks.
- Destroy the PLO.
- Force the Syrian peacekeeping force out of Lebanon.
- Neutralize Lebanon.

Seven years of preparation, training, battle rehearsals and modified tactics culminated in an invasion that defeated the PLO and Syrian forces in only 8 days.

On that morning, the combined efforts of the IDF, IAF, artillery fires, amphibious assaults and naval gunfire made an impressive calculated assault across the Lebanese border. The IDF pushed across the Lebanese border with minimal resistance until the PLO fell behind the Syrian defensive line. The Israeli combined arms assault proceeded along three avenues of advance northward into Lebanon. The IAF launched a large-scale air attack to quickly gain air superiority. Air superiority enabled the IAF to provide close air support (CAS) to the approaching IDF. Following the elimination of the Syrian air defense artillery (ADA) sites, the IDF proceeded with a combined attack of CAS, assault helicopters, massed artillery fires, amphibious landings and naval gunfire. This effort allowed the IDF to move forward into Lebanon, surround the PLO in the city of Beirut and force the PLO's hasty evacuation of the country.

The elimination of the Syrian ADA sites was the key to overall accomplishment of the operation that was conducted in three phases: deception, ground attack and the air-to-air combat. Total synchronization of all elements involved characterized this operation.

The Deception

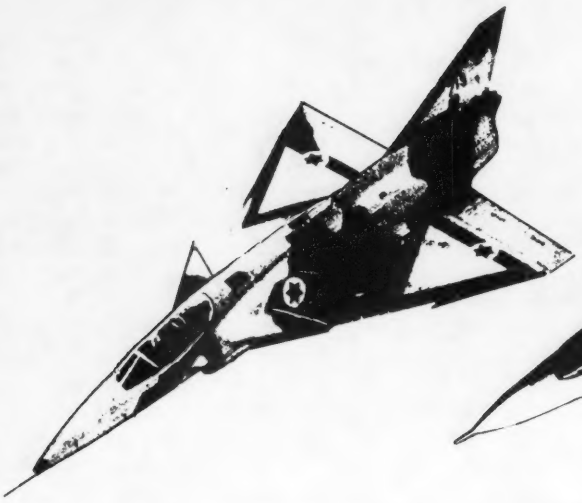
The first phase of the attack was the deception. From the beginning of the conflict, the Israelis conducted extensive electronic warfare to awaken the Syrian radar sites. Using remotely piloted vehicles (RPVs), the Israelis were able to deceive the Syrian ADA systems into believing that they were actually seeing incoming Israeli aircraft. (See "Remotely Piloted Vehicles: One Marine's Perspective," page 56.) Using RPVs, several E-2C surveillance aircraft, and F-4s, the Israelis pinpointed the radar sites and passed this information on to the fighter bombers and artillery. This made the second phase of the attack, the actual destruction of the ADA weapons, possible.

Ground Attack

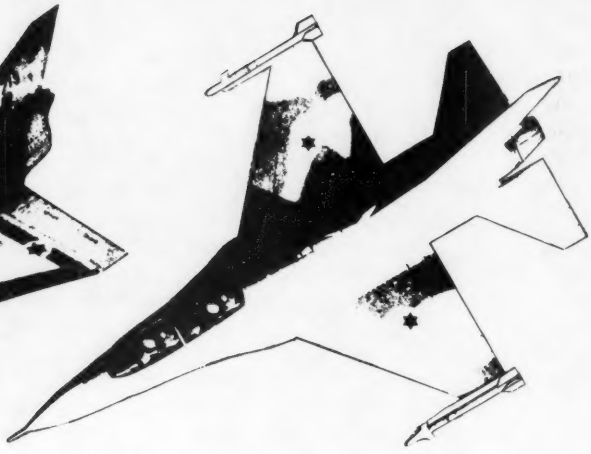
Two closely coordinated elements comprised the second phase of the operation, command and control (C^2) assets and the attack aircraft. First, the overall C^2 of the attack on the radar sites was carried out by E-2C Hawkeye

1. The 1982 Israeli War in Lebanon: *Implications to Modernize Conventional Warfare*, Defense Technical Information Center (DTIC), NDU-NWC 83-027/27A, Alexandria, VA, 1983, p. 6.

The first phase of the attack was carried out by E-2C surveillance aircraft, remotely piloted vehicles and F-4 aircraft.



Israeli Kfir aircraft attacked air defense artillery sites.



The second phase of the Israeli attack included air attacks on Lebanese missile sites by F-16s.

airborne warning and control system (AWACS) aircraft assisted by a specially designed Boeing 707 equipped to jam and provide electronic intelligence (ELINT) for incoming fighter and attack aircraft.[2] Though subjected to intensive jamming, both friendly and enemy, these aircraft circled off the coast of Lebanon but were able to remain outside the Syrian air defense umbrella. They also monitored Lebanese and Syrian airspace by providing vectors and battle assistance to Israeli fighters. Both ground based jammers and airborne jammers in CH-53 helicopters jammed transmissions between Syrian aircraft and ground control interceptor (GCI) sites.[3]

The second elements used in this phase consisted of the ground attack aircraft, probably F-4s and Israeli-built Kfir aircraft. Armed with Shrike, antiradiation missile (ARM), air intercept missile (AIM), Maverick missiles, conventional and cluster bombs, the mission of these aircraft was to physically attack the ADA sites.[4]

For the duration of the battle, Mastiff and Scout RPVs provided video coverage of the battle for the IAF commander.[5] The Israelis initiated the second phase by launching a blanket of RPVs toward the Lebanese border to activate the radar sites. The Syrians mistook the drones for full-size fighters and turned on their radars for engagement. The Boeing 707 could then easily verify surface-to-air missile (SAM) radar activity and pinpoint the radar sites. The 707 acting as a targeting center passed SAM locations to the radar strike elements in the northern and southern area of the Beqa'a Valley. In the southern half of the valley, Israeli artillery and ground missiles attacked radar sites. Ground attack aircraft hit the northern radar sites simultaneously, with Shrike, ARM and Maverick missiles.[6] Electronic countermeasures neutralized remaining radar sites while F-4s, Kfir and F-16s flew random low-level patterns engaging the actual missile sites with cluster bombs, standoff munitions and general-purpose bombs.[7] Attacking with the sun at their back, the Israeli fighters ensured a 'blinded' enemy, who could neither optically track nor identify attacking aircraft. Israeli aircraft dispersed chaff and flares, diverting already fired missiles, as the ground attack aircraft fired AGM 45 and AGM 78 missiles on the radar sites.[8] Self-guided ARMs memorized the targeted locations and zeroed in on the radar sites. The

employment of Shrike and standard radar guided missiles mounted on F-4G aircraft further enhanced the kill ratio.[9] The score, at completion of this well-organized, 10-minute battle, was 17 of 19 SA-6 sites destroyed along with several SA-2 and SA-3 sites.[10]

Air-to-Air Combat

The final phase was the air-to-air fight. As the alerted Syrian aircrews lifted off, the Israeli quickly disrupted their C^2 network through jamming, thus making it impossible for them to contact their GCI controllers.[11] At the same time the top-cover effort operated with secure voice and data link radios that made Syrian jamming attempts futile. Because of the outstanding intelligence provided, the poorly trained Syrian aircrews were easy targets for the waiting IAF combat air patrols (composed of F-15 and F-16 aircraft). The E-2C, with its 200-mile range, picked up MiG activity and transmitted the intercept vectors to the awaiting combat air patrols (CAPs). With the loss of 85 MiG-21s and MiG-23s, more than 25 percent of the Syrian air force was destroyed, rendering it combat ineffective.[12] The majority of the kills were made by the highly successful AIM-9L. Note: Only 7 percent of the Syrian MiG losses were due to cannon fire, attributing to the performance of the AIM-9L and AIM-7 missiles.[13] The Syrians suffered one of the greatest losses in modern aviation history.

After clearly winning air superiority, the Israeli were free to conduct CAS missions virtually unopposed. Both immediate and preplanned strikes were successful and, for the most part, carried out in a timely manner. Because of the initial success of the SAM suppression, many of the CAP fighter aircraft were able to quickly switch to CAS missions.[14] The precision munitions used during this operation were of the most sophisticated technology. This was demonstrated numerous times during strikes inside urban areas. Targeted buildings were destroyed, with only minimal civilian casualties.

The IAF proved several important points during this operation, some are:

- Successful deception in any operation greatly enhances relative combat power.
- AWACS provided command, control and communication that would otherwise be unachievable. Seeing the entire battlefield the command structure was able to make accurate and timely decisions. (F-15s used their radar to guide F-16s to incoming low-to-medium altitude MiGs while they remained as top CAPs.)
- ELINT gathering RPVs are a cost-effective and valuable real-time intelligence asset.
- The ability to jam and disrupt the C^2 nets is imperative to any operation.

Helicopter Assets

The second arm of the IAF consists of helicopter assets, both attack and assault. Unlike the U.S. Army, all Israeli aircraft fall under the IAF. Following the 1973 Mideast War, Israel looked for a way to stem the tide of rapidly moving armor assaults during mobilization. The Israelis have turned to attack helicopters to fill this gap in their defense.[15] The importance they place on this asset is demonstrated by a pilot to seat ratio of 2:1. This ensures a crew for each aircraft even during 24-hour operations.[16] Israel has a fighting force of pre-

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2. *Moscow's Lessons From the 1982 Lebanon Air War*, Defense Technical Information Center, A148310, Alexandria, VA, 1984, p.6.
3. Ibid.
4. Ibid.
5. Ibid., pp. 6-7.
6. Ibid., p. 7.
7. Ibid.
8. DTIC, NDU-NWC 83-027/27A, p. 19.
9. Ibid.
10. DTIC, A148310, p. 7.
11. Ibid., p. 8.
12. Ibid.
13. Ibid., p. 10.
14. DTIC, NDU-NWC 83 027/27A, p. 21.
15. "Israeli's Combat Helicopters," *Defence Update International*, No. 67, 1986, p. 10.
16. Lieutenant Colonel Kenneth Kimes, *Interview with Israeli Air Force Attack Helicopter Pilots*, November 1982, p.2.

dominately Bell AH-1S and Hughes 500MD TOW armed helicopters.[17]

The Lebanon War provided for the use of the AH-1S and 500MD in a conventional conflict with a high-ADA threat scenario. Operation Peace for Galilee proved that helicopters not only can survive but they are an effective combat multiplier even in this setting.

Attack Helicopter Operations

The high-ADA threat was not the only hindrance to attack helicopter operations. Because of the significant variance between Lebanese and Israeli terrain, several environmental factors caused changes to operational procedures. High altitude, temperatures and pressure altitude required modifications to fuel loads, ammunition loads and the actual aircraft mix.[18] Both helicopters were armed with TOW missiles, with the AH-1S usually carrying both TOW and 200 rounds of 20 mm cannons for suppression. Rockets were rarely carried by either the 500MD or the AH-1S.[19]

The primary mission of the attack helicopter squadron (18 AH-1S) was essentially the same as its U.S. counterpart: the destruction of enemy tank formations. When terrain permitted, the Israeli used similar tactics to those of the United States. But there were also fundamental tactical differences that work well for the Israeli.

One is that both attack and scout helicopters are armed. During the battle, the attack helicopter commander controls the attack. He receives the target handover from his scout aircraft. The scout conducts reconnaissance and telescopic acquisition using his target sight unit (TSU).[20] Laser rangefinders and TSU reticles permitted accurate range estimation and prevented the waste of TOW missiles. Oftentimes, scouts fired TOW missiles to mark the target location for the attack helicopters. Pilots stated that they averaged up to four TOW missile shots per day.[21] Israeli helicopter pilots are not trained in the adjustment of artillery and this was recognized as a disadvantage in the analysis of the operation.

In addition, night flight using AN/PVS-5 devices is practiced but was rarely used because of the limited night capability of the TOW system on the AH-1S and 500MD.[22] Although the Israeli helicopters did not participate in air-to-air battles, the attack helicopters actively sought the Syrian Gazelles.[23] The Syrian Gazelles, armed with HOT missiles, were a significant threat to advancing IDF armor formations and halted several advances even though 12 were shot down by Israeli ground forces.[24]

The Israeli found the TOW extremely reliable even out to its maximum range (3,750 m). The missile was fired both over water and powerlines with no apparent effect on the system.[25] The majority of firings were from forward slope positions, but the Israeli preferred to use defilade positions that offered good ingress and egress along with adequate backdrop. Though the aircraft experienced some jamming, it did not hinder operations. The attack helicopter priority of fires included the following:

- Air defense weapon systems threatening the attack aircraft.
- C^2 and specialty vehicles, i.e., AVLB (antennas, the primary means of identifying command vehicles, were extremely hard to see at attack distances).
- Tanks/infantry fighting vehicles.

One of the important aspects of the helicopter battles was the modification of the organization into separate hunter killer teams. In higher elevations, the AH-1S was employed because of the limited power of the TOW armed 500MD.[26] Working in mutually supporting pairs, they used their 20 mm cannon to provide support to one another.[27] (The cannon, which often jammed during training, proved reliable in combat conditions.) The attack helicopters found battlefield intelligence lacking, requiring face-to-face coordination with the ground commander. The intensity of the battle required them to frequently locate targets and engage independent of their ground counterpart.[28]

The TOW armed 500MDs are employed similarly at lower elevations, but with one major difference. Because of their low noise signature, the 500MDs were able to cross the forward line of own troops undetected and interdict reinforcing Syrian tank formations at close range.[29]

The threat to the helicopters was divided into two areas—obstacles and enemy assets. Wires were considered to be the most significant flight hazard by the Israeli. High-density altitude and winds also were a factor during the entire operation.

The enemy threats most feared by the pilots were small arms fire, ADA gun systems and maintank gun rounds. The two admitted losses of Israeli helicopters were due to tank maingun rounds (armor piercing fin stabilized dis-

*U.S. G.P.O. 1990-731-035:20003

carding sabot).[30] The pilots attributed this to prolonged exposure time at the target area. Radar and infrared (IR) missile systems were of little effect because of ground clutter, IR jammers and radar jammers, either onboard or in support of their mission.

Assault Operations

Assault helicopters played a no less important role to the overall accomplishments of the IAF. Supporting the initial assault, heliborne tank killer teams were used to bypass enemy strong points and urban defenses and establish blocking positions in support of the ground maneuver. CH-53s conducted resupply of ammunition to the advancing artillery, infantry and tank columns.[31] This ability to resupply rapidly by air enabled the IDF to maintain the momentum of its attack.

Helicopter assets worked from a forward deployed airfield near the Lebanese border.[32] All aspects of maintenance, refueling and rearming were carried out at this location. Only on few occasions were forward arming and refueling points established, and then only for a short duration with limited assets.

The overall accomplishments of Israeli's helicopters in the 1982 Lebanese War far exceeded their limited number on the battlefield. Some of the lessons learned that we can benefit from are as follows:

- The lack of real-time intelligence is to be expected and planned for.
- The ability to adapt doctrine to actual conditions may be necessary and must be expected.
- The attack helicopter, in its present form, is a formidable weapon.
- Reduced exposure time and repositioning after an engagement is essential to survival.
- Small arms fire remains the principle threat to helicopters.
- New targeting systems and ammunition capabilities make the tank a formidable opponent.
- Heliborne resupply is essential to highly mobile armor forces.

Lessons Learned

It is important that we do not compare the U.S. doctrine too closely to Israeli combat experience. The IDF spent a great deal of time and resources conducting a lightning-fast preemptive strike that is imperative to the strategic defense of their nation. In light of the current U.S. doctrine, it is not likely that American Forces would have the opportunity in a European scenario to employ such a detailed plan. But there are many lessons to be learned from this conflict that would apply to a low-intensity conflict where the United States would wish to achieve a quick and convincing victory. The following are some of those lessons learned:

- The combined arms concept is effective if overall control is maintained.
- New technologies give greater flexibility to the attacker.
- Initiative and imagination are essential elements in leaders.
- Leaders must have real-time battle intelligence, necessitating that they see the battlefield.
- Intelligence enhanced the overall effectiveness of the IDF and was accomplished through the use of highly sophisticated intelligence gathering devices.

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17. Kimes, "Israeli's Combat Helicopters," *Defence Update International*, p. 9.
18. Kimes, p. 3.
19. Ibid., p. 4.
20. Ibid., p. 2.
21. Ibid., p. 5.
22. Ibid., p. 3.
23. Ibid., p. 2.
24. Francis Tusa, "Lebanon 1982: Israeli Hubris or Syrian Strength?" *Armed Forces*, September 1987, p. 419.
25. Kimes, p. 4.
26. "Israeli's Combat Helicopters," *Defence Update International*, p. 11.
27. Kimes, p. 4.
28. Ibid.
29. "Israeli's Combat Helicopters," *Defence Update International*, p. 39.
30. Kimes, p. 4.
31. Ibid., p. 5.
32. Ibid., p. 2.

USAASO SEZ

U.S. Army Aeronautical Services Office

National Security Areas

Mr. Jesse M. Burch Jr.
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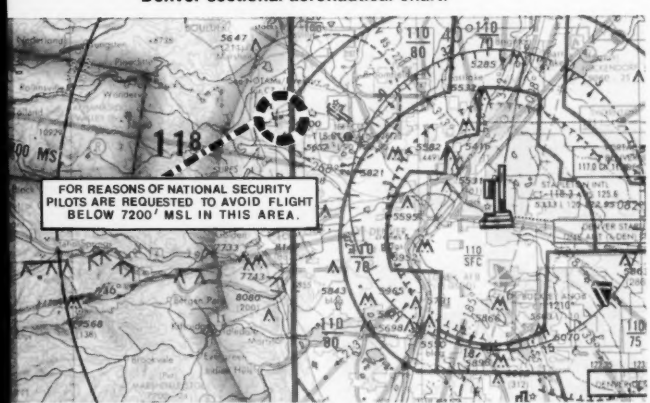
Cameron Station, Alexandria, VA

YOU HAVE BEEN studying the Denver, CO, Sectional Aeronautical Chart for some time. Then you discover to the west of Denver, just inside the outer ring of the Denver terminal control area, a ½ by 2½-inch magenta rectangle containing the following words: *For reasons of national security, pilots are requested to avoid flight below 7,200 feet mean sea level (MSL) in this area.*

From the top center of this rectangle is a dotted line, also magenta in color, that leads to a broken magenta circle. What have you found? Is the circle regulatory for pilots? The answer to the first question: one of several national security areas. The answer to the second question: no and a qualified yes.

Denver sectional aeronautical chart.



A national security area is not regulatory for pilots, but rather is advisory in nature. All pilots are requested not to overfly these areas below specified altitudes. However, altitudes may vary from area to area. This rule also applies to Army aviators except when they fly over Department of Energy (DOE) facilities: Idaho Falls, Idaho Falls, ID; Livermore National Laboratory, Livermore, CA; Los Alamos, Los Alamos, NM; Oak Ridge, Oak Ridge, TN; Rickland, Rickland, WA; Rocky Flats, Golden, CO; Savannah River, Aiken, SC; and Site 300, Livermore, CA.

As listed in the DOD Flight Information Publication Area Planning/1, Army aircraft will not overfly these facilities below 2,000 feet MSL except when:

a. Flight across a facility becomes necessary because of an emergency or military necessity.

b. Weather forces a visual flight rules flight below 2,000 feet MSL and the aviator cannot circumnavigate the area.

c. Flight supports a DOE requirement or mission.

When a. or b. occurs, the aviator will attempt to communicate, by telephone or radio, with the particular DOE facility before overflying the facility. If contact cannot be established before overflight, DOE will pay for telephone calls concerning overflights. Therefore, Army personnel may call collect.